2011 Air Quality Progress Report for Fife Council

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Report to Fife Council
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Executive Summary

This Air Quality Progress Report has been prepared for Fife Council as part of the Local Air Quality Management (LAQM) system introduced in Part IV of the Environment Act 1995. The Local Air Quality Management Technical Guidance LAQM.TG (09)[2] has been closely followed in the preparation of this report.

On the basis of this assessment, no further action is required in respect to pollutants; Carbon Monoxide, Benzene, 1-3 butadiene, Lead and Sulphur Dioxide.

Analysis of the 2010 Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}) monitoring data concluded the following:-

- Monitoring of NO_2 at the three automatic sites in Fife showed that concentrations at Appin Crescent, Dunfermline, Bonnygate, Cupar and Admiralty Road, Rosyth, were below the annual mean objective.
- Local bias adjusted diffusion tube data at 3 locations within Fife exceeded the NO_2 annual mean objective of 40 $\mu g/m^3$. These locations were: Appin Crescent, Dunfermline; Admiralty Road, Rosyth; and St Clair Street, Kirkcaldy.
- Diffusion tube data at Bonnygate Cupar did not exceed the 40 $\mu g/m^3$ objective when using the locally derived bias adjustment factor (0.71). Using the more conservative national derived bias adjustment factor of 0.78 leads to a borderline exceedence (40.5 $\mu g/m^3$) at one Bonnygate tube site (3A,B) near to the Bonnygate/Crossgate junction. Despite some uncertainty regarding the validity of the national bias adjustment factor due to the small number of samples used, Fife Council have adopted a precautionary approach and used the more conservative national factor in preference to the locally derived factor. However, generally the data shows that NO_2 diffusion tube concentrations have reduced since the introduction of traffic management measures in 2009. The apparent downward trend in NO_2 concentrations will be confirmed through ongoing monitoring.
- Data collected for 2010 showed that both the Bonnygate and Admiralty Road sites marginally exceeded the annual mean objective for PM_{10} with concentrations of 19 $\mu g/m^3$.
- In 2008 Fife Council declared Bonnygate, Cupar as an AQMA for NO_2 and PM_{10} and have since adopted an Air Quality Action Plan in 2010 to address the air quality issues. Diffusion tube concentrations in the Bonnygate area have decreased over 2009 and 2010, which is consistent with automatic monitoring concentrations.
- Fife Council should consider declaring an AQMA at Appin Crescent, Dunfermline (which was the subject of a recent Detailed Assessment), encompassing as a minimum all residential properties which lie between Park Lane and Couston Street. Fife Council should also consider declaring an area larger than that stated to account for any uncertainties in monitoring and modelling carried out.
- To further investigate NO_2 concentrations within Admiralty Road, Rosyth, Fife Council should increase diffusion tube monitoring, incorporating more locations of relevant exposure to the general public. It is also concluded that Fife Council should continue monitoring PM_{10} at Admiralty Road for another year before moving on to a Detailed Assessment.
- Fife Council installed an automatic monitoring station at St Clair Street, Kirkcaldy in February 2011 to further investigate NO_2 and PM_{10} concentrations. This data should be analysed in the 2012 Updating and Screening Assessment (USA), and if found to be exceeding the objective, and in accordance with the Technical Guidance LAQM. TG (09), Fife Council should proceed with a Detailed Assessment.

Fife Council will implement the recommendations contained in this report.

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1 Introduction

1.1 Description of Local Authority Area

Fife is an area in eastern Scotland bordered on the north by the Firth of Tay, on the east by the North Sea and the Firth of Forth to the south. The route to the west is partially blocked by the mass of the Ochil Hills. Almost all traffic into and out of Fife has to pass over one of four bridges, south on the Forth Road Bridge, west on the Kincardine Bridges or north east via the Tay Road Bridge, the exception being traffic headed north on the M90.

The coast has some small harbours, industrial docks in Burntisland and Rosyth and also fishing villages of the East Neuk such as Anstruther and Pittenweem. The large area of flat land to the north of the Lomond Hills, through which the River Eden flows, is known as the Howe of Fife. North of the Lomond Hills can be found villages and small towns in a primarily agricultural landscape. The areas in the south and west of Fife, including the towns of Dunfermline, Glenrothes, Kirkcaldy and the Levenmouth region are much more industrial and densely populated.

1.2 Purpose of Progress Report

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedance of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in Scotland are set out in the Air Quality (Scotland) Regulations 2000 (Scottish SI 2000 No 97) and the Air Quality (Scotland) (Amendment) Regulations 2002 (Scottish SI 2002 No 297). They are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu g/m^3$ (for carbon monoxide the units used are milligrammes per cubic metre mg/m^3). Table 1.1 includes the number of permitted exceedences in any given year (where applicable).

Table 1.1: Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in Scotland

Pollutant			Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu g/m^3$	Running annual mean	31.12.2003
	3.25 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	18 $\mu g/m^3$	Annual mean	31.12.2010
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

This section will summarise conclusions made by the previous three rounds of air quality review and assessments.

The first round of review and assessment reports concluded that additional assessment was not necessary for any pollutants in the strategy, and that Fife Council did not need to declare any Air Quality Management Areas (AQMAs).

The second round of Review and Assessment reports (2003 Updating and Screening Assessment (USA)[3] and 2004 & 2005 Progress reports[4, 5]) concluded that the Air Quality Objectives for sulphur dioxide, carbon monoxide, 1,3-butadiene, benzene and lead are unlikely to be exceeded.

The 2003 USA[3] identified that high NO_2 concentrations were recorded at kerbside locations in North Approach Road, Kincardine; Carnegie Drive, Dunfermline and Admiralty Road, Rosyth. As this was based on kerbside data it was recommended that further diffusion tube monitoring be undertaken at the façade of the buildings in order to improve the assessment of potential exposure.

Furthermore, the 2005 Progress Report[5] recommended that automatic monitoring of NO_2 be undertaken at Admiralty Road, Rosyth and Bonnygate, Cupar. Additionally, it was recommended that automatic monitoring continue at North Approach Road, Kincardine.

PM_{10} monitoring also commenced at Admiralty Road, Rosyth and Bonnygate, Cupar.

The 2006 USA[6] recommended that monitoring of NO_2 and PM_{10} continue at Bonnygate, Cupar and recommence at Admiralty Road, Rosyth to better assess concentrations of each pollutant.

Automatic monitoring of NO_2 was discontinued at North Approach Road, Kincardine in May 2007 as the relevant air quality objectives were met at this location. As a result of a new bridge crossing and northern bypass road further reductions of NO_2 have been realised at this location.

Monitoring data for 2006 and 2007 (automatic and diffusion tubes) indicated that it was likely the NO_2 and PM_{10} air quality objectives would not be met in Bonnygate, Cupar. The 2007 Progress Report[7] concluded that a Detailed Assessment should be carried out at this location. Additionally, the 2008 Progress Report[8] concluded that a Detailed Assessment should be carried out for Appin Crescent, Dunfermline (NO_2) and Admiralty Road, Rosyth (PM_{10}).

The Detailed Assessment (2007/2008) for Bonnygate, Cupar[9] considered NO_2 and PM_{10}. The report concluded that an AQMA should be declared for both NO_2 and PM_{10}.

The Detailed Assessment (2008) for Appin Crescent, Dunfermline[10] advised that increased monitoring of NO_2 should be carried out to enable improved characterisation of ambient NO_2 concentrations before any further decisions are made.

The Detailed Assessment (2009) for Admiralty Road, Rosyth[11] considered PM_{10} concentrations in the area and concluded that no further action was required.

The 2009 USA[12] concluded that further NO_2 monitoring should be carried out at St Clair Street, Kirkcaldy before any further action is taken. It also concluded that a Detailed Assessment should be carried out for the Kinghorn Primary School Biomass Boiler for PM_{10} and NO_2.

The Further Assessment (2010) for Bonnygate, Cupar[13] concluded that the AQMA was still required and that its boundary was appropriate (see Figure 1.1). The source apportionment found that heavy and light goods vehicles contributed broadly similar NO_x emissions and that action planning should therefore focus on both vehicle types.

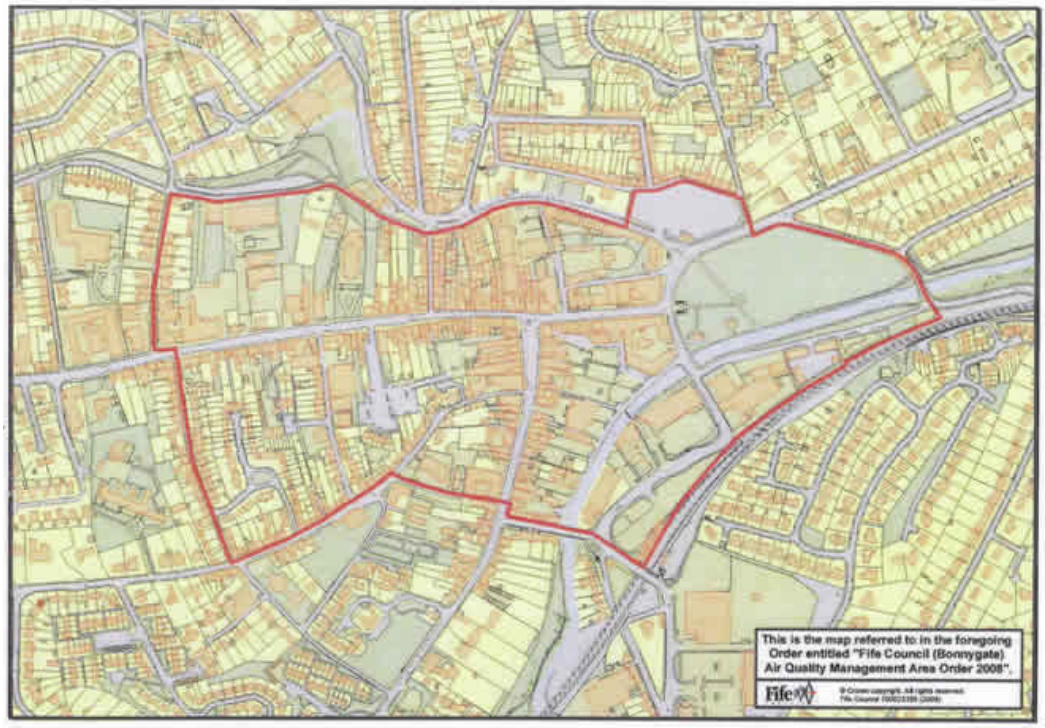
An Air Quality Action Plan[14] was adopted by Fife Council for the Bonnygate, Cupar in October 2010.

The 2010 Progress report[15] concluded that for NO_2 and PM_{10} monitoring, no further action was required, over and above that already in progress by Fife Council. It was concluded that if NO_2 concentrations, within the Appin Crescent area exceed the annual mean objective when 12 months diffusion tube data was available then Fife Council should proceed immediately to a Detailed Assessment.

At the end of 2010 a Detailed Assessment was carried out at Appin Crescent, Dunfermline. This Detailed Assessment considered NO_2 concentrations and concluded that Fife Council should consider declaring an Air Quality Management Area (AQMA) at Appin Crescent. Fife Council should therefore proceed with a Further Assessment and work towards preparing an Air Quality Action Plan for this area. Due to the NO_2 concentrations measured at Appin Crescent the Detailed Assessment recommended that automatic measurement of PM_{10} should be carried out.

Previous Review and Assessments have concluded that concentrations of lead, 1,3-butadiene and benzene are well below their respective objective at all locations in Fife. There has been no change in sources of these pollutants so they are not considered further in this report.

Figure 1.1: Map of Bonnygate AQMA Boundary



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

New monitoring data for 2010, for the following pollutants, have become available since the 2010 Progress Report and are reviewed for this report:

- Carbon Monoxide (CO);
- Benzene;
- 1,3 Butadiene;
- Nitrogen Dioxide (NO_2);
- Sulphur Dioxide (SO_2); and
- PM_{10}.

Fife Council carries out automatic monitoring for NO_2 and PM_{10} throughout Fife and also has an extensive NO_2 diffusion tube Network.

Automatic SO_2 data are also available from Scottish Power Generation Ltd from a monitoring site close to Longannet Power Station[16]. The station's PPC permit from SEPA requires that air quality impacts around Longannet Power Station be assessed with respect to the AQS objectives.

As part of the commitment to monitor any potential environmental impact from its Grangemouth oil refinery on the surrounding area, INEOS Manufacturing (Scotland) Ltd conduct an ongoing ambient air quality monitoring survey[17] over a wide area around the Firth of Forth. Results of this monitoring are summarised in section 2 of this report.

A summary of the Mossmorran and Braefoot Bay Independent Air Quality Monitoring Review Group Report 2010[18] is also provided in this Progress Report. The report was commissioned by ExxonMobil to assess concentrations of 1,3 butadiene, benzene and particulate matter.

Measurements of benzene and other hydrocarbon compounds are also undertaken by NPL on behalf of BP Exploration Operating Company Ltd in the vicinity of Hound Point. The data from this monitoring was not made available to Fife Council at the time of producing this report.

2.1.1 Automatic Monitoring Sites

Fife Council operated three automatic air quality monitoring stations during 2010. Full details of these monitoring stations are provided in Appendix A and are summarised in Table 2.1. Maps of the locations can be seen in Figures 2.1, 2.2, and 2.3.

Short-period CO monitoring has also been undertaken by Fife Council Transportation Department.

SO_2 monitoring is also undertaken on behalf of Longannet Power Station at Blair Mains (Grid Reference NS972864) to the north east of the power station. This is at the area identified by modelling as likely to experience the maximum impact of the power station plume.

2.1.2 New Automatic Monitoring

Fife Council have added to their automatic monitoring programme with the installation of a new site in St Clair Street, Kirkcaldy, monitoring NO_x and PM_{10}, and with the extension of the monitoring site at Appin Crescent, Dunfermline, to include PM_{10}. Monitoring at Kirkcaldy and Dunfermline (PM_{10}) commenced February and April 2011 respectively. Full details of this additional automatic monitoring are provided in Appendix A and summarised in Table 2.1. A map of the location can be seen in Figure 2.4 of this report.

2.1.3 QA/QC of the automatic monitoring data in Fife

AEA undertook quality control of the automatic data for Fife Council monitoring sites during 2010. The Quality Assurance/ Quality Control (QA/QC) procedures follow the requirements of the Technical Guidance (09)[2] and are equivalent to those used at the UK National Network (AURN) monitoring sites. This gives a high degree of confidence in the data obtained, both for reliable concentrations at the automatic sites and for bias correction data for the diffusion tubes.

In order to satisfy the requirement outlined in the Technical Guidance (09), the following QA/QC procedures were implemented:

- 3-weekly calibrations of the NO_x analyser,
- 6-monthly audits and servicing of the monitoring site,
- Data ratification.

Calibrations of the NO_x analyser were carried out using certified compressed gas standards (ISO17025). This ensured that the calibration gas was traceable to national and international standards. In addition to the calibration, sample filters were changed for both NO_x and TEOM analysers and any faults were identified thus minimising data loss.

Audits of the monitoring site consisted of a number of performance checks to identify any faults with the equipment. The calibration cylinder was also checked against another gas standard in order to confirm the gas concentration. Any identified faults were forwarded on to the service unit for repair.

The final stage of the QA/QC process was to ratify the data. During ratification, all calibration, audit and service data are collated and the data are appropriately scaled. Any suspect data identified are deleted therefore ensuring that the data are of a high quality.

Casella Measurement carried out QA/QC procedures at the SO_2 Automatic Monitoring site at Blair Mains. These procedures were also to a standard equivalent to the AURN.

Figure 2.1 Bonnygate, Cupar, Automatic Monitoring Location

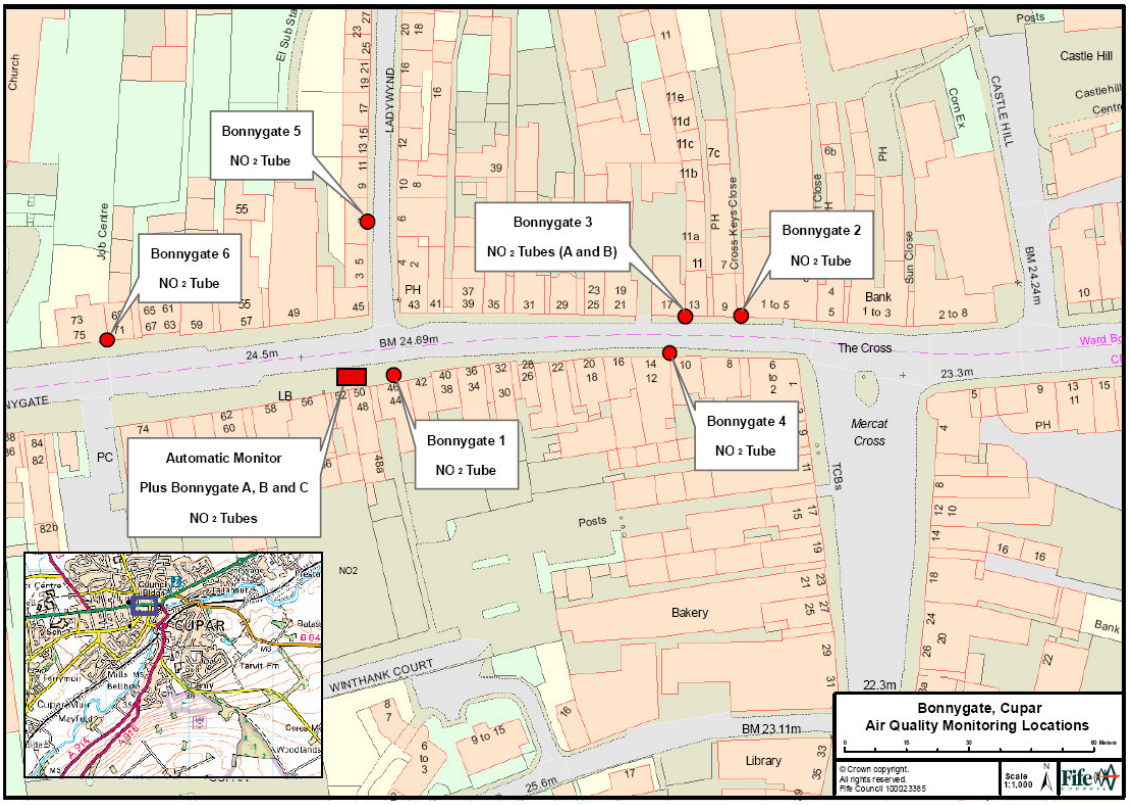


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Figure 2.2: Appin Crescent, Dunfermline, Automatic Monitoring Location

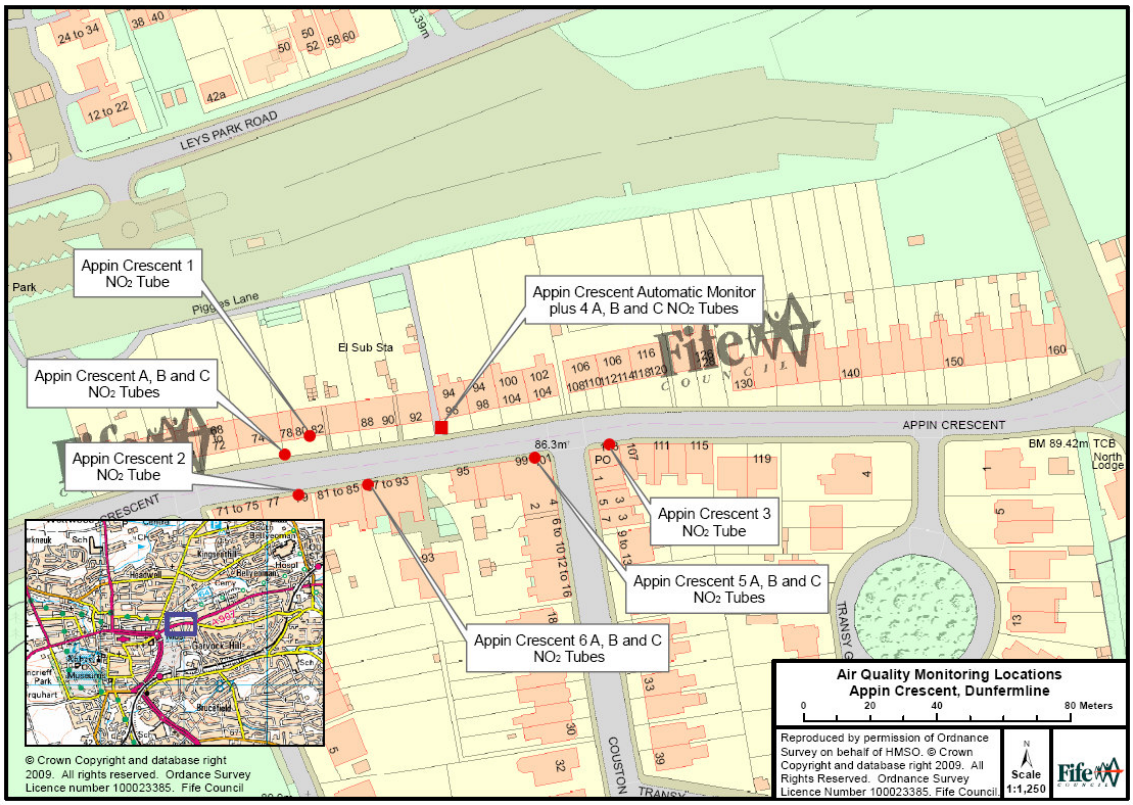

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Figure 2.3: Admiralty Road, Rosyth, Automatic Monitoring Location

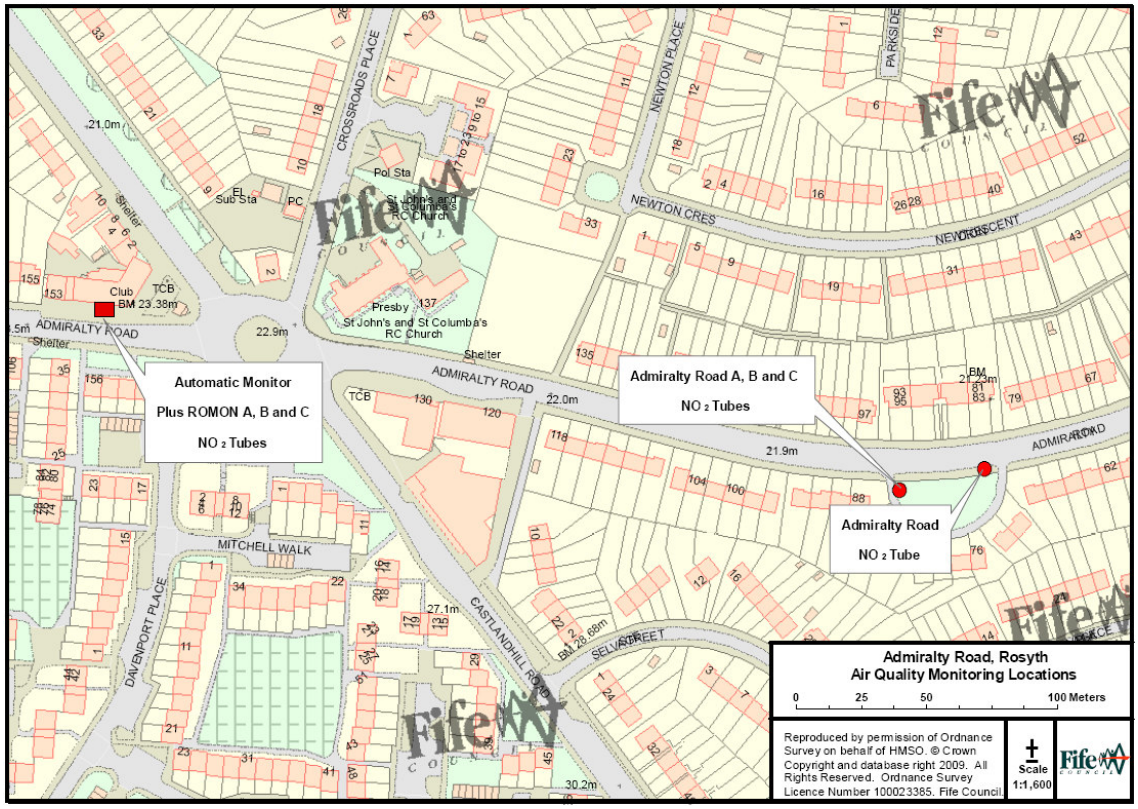

Figure 2.4: St Clair Street, Kirkcaldy, Automatic Monitoring Location

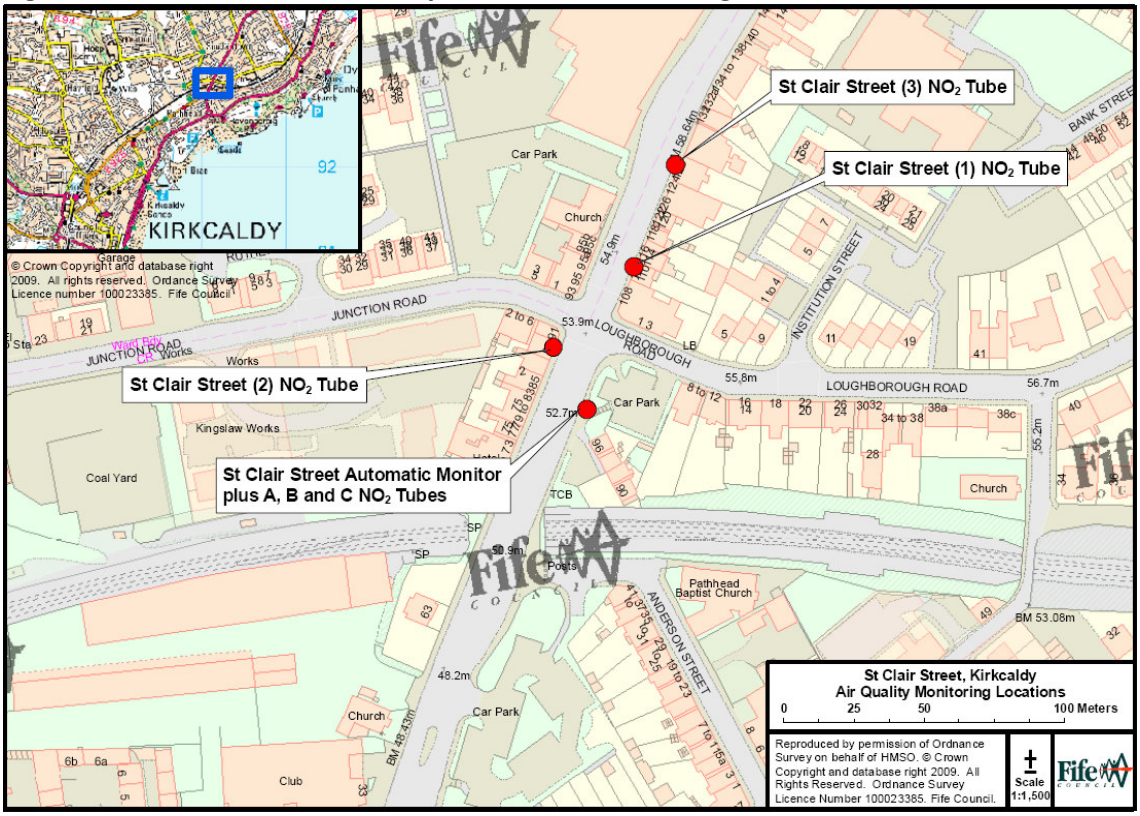

Table 2.1: Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	Monitoring Technique	In AQMA ?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
Bonnygate, Cupar	Kerbside	X337406	Y714574	NO_2, PM_{10}	NO_x Analyser, TEOM-FDMS	Y	N (5.0 m)	< 0.5 m	Y
Appin Crescent, Dunfermline	Roadside	X309926	Y687722	NO_2, (PM_{10} installed March 2011)	NO_x Analyser, TEOM-FDMS	N	Y	4.0 m	Y
Admiralty Road, Rosyth	Roadside	X311755	Y683503	NO_2, PM_{10}	NO_x Analyser, TEOM-FDMS	N	Y	6.0 m	Y
St Clair Street, Kirkcaldy	Roadside	X329143	Y692986	NO_2, PM_{10}	NO_x Analyser, TEOM-FDMS	N	N (10.0 m)	5.0 m	Y

2.1.4 Non-Automatic Monitoring

Fife Council operates an extensive NO_2 diffusion tube monitoring survey with monitoring sites in East, West and Central Fife. In total there are 64 NO_2 diffusion tubes located at 48 sites throughout the local area. Of these, eight sites are triplicate sites, with three of these triplicate sites co-located with the automatic analysers.

There have been two changes to the NO_2 diffusion tube network since the 2010 Progress report. These are:-

- Admiralty Road triplicate site (A,B,C) has moved from the façade of a residential property to a sign post which is equidistant in relation to adjacent buildings and considered relevant exposure to the general public.
- A triplicate site has been collocated with the new automatic St Clair Street, Kirkcaldy site, increasing the number of diffusion tubes in the network to 67 and sites to 49. Data for this site will be provided in the 2012 USA.

Fife Council also undertake SO_2 diffusion tube monitoring with a triplicate tube site at Markinch, close to Tullis Russell Papermakers and the long running monitoring sites at High Valleyfield and Culross, both situated near Longannet Power Station. Details of all diffusion tube monitoring sites are provided in Table 2.3.

Although SO_2 diffusion tube data are not considered sufficiently accurate (and indeed cannot measure over the short term averaging periods that make up the objectives) for inclusion in the Review and Assessment process, they are included for completeness and to provide a broad indication of air quality. Fife Council are to cease SO_2 tube monitoring this year given that such monitoring is not considered suitable for LAQM purposes.

For the INEOS Ambient Atmospheric Survey In The Vicinity of Grangemouth 2010 report[17], monthly measurements were made at 4 sites within Fife using passive diffusion tube techniques. These diffusion tubes monitored, amongst others, pollutants NO_2, SO_2, Benzene and 1,3 Butadiene.

2.1.5 NO_2 Diffusion Tube QA/QC Process

Diffusion tubes used by Fife Council are supplied and analysed by Tayside Scientific Services (formerly Dundee City Council Scientific Services). The laboratory participates in three schemes which ensure that the NO_2 tube results meet acceptable standards.

1. The WASP scheme is run by the Health and Safety Laboratory. Each month one tube is sent for testing. Results are compared with other participating labs and feedback on performance provided.
2. Every three months three tubes and a blank (for analysis) are supplied for exposure at an intercomparison site operated as part of the Support to Local Authorities for Air Quality Management contract funded by the Scottish Government, Defra and the other Devolved Authorities. Again, results are compared with other participating labs and feedback on performance provided.
3. Each month a QC NO_2 solution is also provided via this contract. This solution is run as an internal check for NO_2 tubes in the laboratory. The solution is tested after every 21 NO_2 tube samples.

Tayside Scientific Services also use in-house quality assurance standards. The tube preparation method is 20%TEA in water.

2.1.6 Bias Correction for NO_2 Diffusion Tube data

Diffusion tube samplers are a simple and cost effective method of measuring NO_2. However, they are classed as an indicative method and are known to have a systematic bias compared to more accurate results obtained from calibrated automatic analysers.

The degree of systematic bias depends on the laboratory preparing and analysing the tubes, and also includes the methodology employed for that analysis. Therefore, it is necessary to determine a bias adjustment factor appropriate for the particular diffusion tubes used in Fife. The methodology for determining the appropriate bias adjustment factor is outlined in LAQM TG (09)[2] and several online tools are also available to assist with this process.

The local bias factor is calculated using sites where a triplicate set of diffusion tubes are co-located with a chemiluminescence analyser. The national bias adjustment factor is derived using the national database co-location studies.

Fife Council has three co-location sites that can be used to calculate the local bias adjustment factor. The local bias adjustment factor for each individual location was calculated using the "LAQM Tool" described in section A1.191 of LAQM TG (09)[2]. The results are shown in Table 2.2 below. Calculations are shown in Appendix C.

Table 2.2: Bias correction factors for 2010 for NO_2 diffusion tubes in Fife

Source	Bias adjustment Factor 2010
Appin Crescent, Dunfermline	0.79
Bonnygate, Cupar	0.71
Admiralty Road, Rosyth	0.85
Nationally Derived	0.78

The average of the bias adjustment factors from Appin Crescent, Dunfermline, Bonnygate, Cupar and Admiralty Road, Rosyth is **0.78**. The national derived Bias adjustment factor was calculated as **0.78**. This calculation was carried out using the most up to date National Bias Adjustment Factor Spreadsheet (version number 04/2011, shown in Appendix C).

For this report, diffusion tube data will be bias adjusted using the respective locally derived bias adjustment factors. Where there is no local bias adjustment factor relevant to the location of the diffusion tube **0.78** will be used. For completeness and comparison of data, Fife Council have provided bias adjusted diffusion tube data using both local and national bias adjustment factors where appropriate.

Table 2.3: Details of Non- Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location?
NO_2 Diffusion Tubes West Area								
St Leonards Primary School, Dunfermline	R(F)	X 309770	Y 686895	NO_2	N	Y	10.6	Y
Carnegie Drive (A,B,C), Dunfermline*	R(F)	X 309019	Y 687632	NO_2^*	N	Y	2.3	Y
Rumblingwell, Dunfermline (5N)	R	X 307866	Y 688231	NO_2	N	N (6.3)	1.7	Y
Aytoun Grove, Dunfermline (6N)	UB	X 308328	Y 688426	NO_2	N	N (7.7)	6.1	N
Admiralty Road, Rosyth (AQM 5)	K	X 312103	Y 683439	NO_2	N	N (12.3)	0.5	Y
Admiralty Road (A,B,C), Rosyth*	R(F)	X 312074	Y 683428	NO_2^*	N	Y	5.0	Y
Admiralty Road (A,B,C) ROMON*	R(F)	X 311755	Y 683503	NO_2^*	N	Y	6.5	Y
Barrie Street, Dunfermline (8N)	UB	X 308379	Y 688249	NO_2	N	N (6.3)	0.5	N
Appin Crescent (A)(B)(C), Dunfermline (9N)*	R	X 309897	Y 687713	NO_2	N	N (5.1)	1.6	Y
Appin Crescent (1) Dunfermline	R(F)	X 309891	Y 687716	NO_2	N	Y	6.5	Y
Appin Crescent (2) Dunfermline	R(F)	X 309975	Y 687716	NO_2	N	Y	1.5	Y
Appin Crescent (3) Dunfermline	R(F)	X 309975	Y 687716	NO_2	N	Y	1.8	Y
Appin Crescent 4(A)(B)(C) Dunfermline*	R(F)	X 309926	Y 687722	NO_2^*	N	Y	3.9	Y
Appin Crescent 5(A)(B)(C)*	R(F)	X 309974	Y 687716	NO_2	N	Y	1.5	Y
Appin Crescent 6(A)(B)(C)*	R(F)	X 309904	Y 687704	NO_2	N	Y	1.5	Y
High Street, Cowdenbeath	K	X 316523	Y 691740	NO_2	N	N (3.5)	0.5	Y
North Approach Road (A, B) Kincardine	K	X 293182	Y 687549	NO_2	N	N (11.0)	0.5	Y
Pittencrieff St, Dunfermline	R(F)	X 308743	Y 687549	NO_2	N	Y	0.5	Y
NO_2 Diffusion Tubes Central Area								
St Clair Street (1), Kirkcaldy	R(F)	X 329105	Y 692992	NO_2	N	Y	1.3	Y
St Clair Street (2), Kirkcaldy	R(F)	X 329185	Y 693055	NO_2	N	Y	1.8	Y

St Clair Street (3), Kirkcaldy	R(F)	X 329173	Y 693069	NO_2	N	Y	2.0	Y
St Clair Street (A,B,C), Kirkcaldy*	R	X329143	Y692986	NO_2	N	N (10.0)	5.0	Y
Wedderburn Road, Kirkcaldy	UB	X 325228	Y 693086	NO_2	N	N (8.6)	0.5	N
Lovat Road, Glenrothes	K	X 328600	Y 699470	NO_2	N	N (7.7)	0.5	Y
Dunnikier Rd, Kirkcaldy	R(F)	X 328152	Y 692350	NO_2	N	Y	3.4	Y
Victoria Rd, Kirkcaldy	R(F)	X 328152	Y 692325	NO_2	N	Y	2.5	Y
Glenlyon Road, Levenmouth	K	X 337357	Y 701318	NO_2	N	N (26.8)	1.0	Y
Leslie High St	R(F)	X 325111	Y 701806	NO_2	N	Y	3	Y
Queensway, Glenrothes	K	X 327849	Y 701114	NO_2	N	N (17.0)	1.0	Y
Adsa Roundabout, Kirkcaldy	K	X 328735	Y 694053	NO_2	N	N (28.0)	1.0	Y
NO_2 Diffusion Tubes East Area								
City Road (1,2), St Andrews	R	X 350586	Y 716580	NO_2	N	N (1.0)	1.5	Y
Bell Street (1,), St Andrews	R(F)	X 350708	Y 716716	NO_2	N	Y	1.6	Y
Bell Street (2) St Andrews	R(F)	X 350716	Y 716669	NO_2	N	Y	2.1	Y
Windsor Gdns, St Andrews (4N)	UB	X 349122	Y 715313	NO_2	N	N (15.6)	1.4	N
Crossgate, Cupar	K	X 337536	Y 714537	NO_2	Y	N (3.0)	0.5	Y
South Road, Cupar	R	X 337513	Y 713616	NO_2	N	N (17.0)	1.8	Y
Cupar Road, Auchtermuchty	R(F)	X 324186	Y 711801	NO_2	N	Y	1.8	Y
Millfield, Cupar (4N)	UB	X 336867	Y 713878	NO_2	N	N (17.0)	8.0	N
Bonnygate, Cupar (1N), Bonnygate 1	R(F)	X 337409	Y 714570	NO_2	Y	Y	5.3	Y
Bonnygate, Cupar, Bonnygate 2	R(F)	X 337493	Y 714586	NO_2	Y	Y	1.7	Y
Bonnygate, Cupar, Bonnygate 3 (A, B)	R(F)	X 337480	Y 714586	NO_2	Y	Y	1.6	Y
Bonnygate, Cupar, Bonnygate B4	R(F)	X 337471	Y 714575	NO_2	Y	Y	1.9	Y
Ladywynd, Cupar, Ladywynd B5	R(F)	X 337405	Y 714596	NO_2	Y	Y	1.0	Y
Bonnygate West, Cupar, Bonnygate B6	R(F)	X 337342	Y 714579	NO_2	Y	Y	3.2	Y
Bonnygate, Cupar, Monitor BA, BB, BC *	K	X 337406	Y 714574	NO_2^*	Y	N (4.8)	0.6	Y
4 East Road, Cupar	R(F)	X 337915	Y 714721	NO_2	Y	Y	14.0	Y
SO_2 Diffusion Tubes								
Main Street, Culross	UB	X 297860	Y 685299	SO2	N	N/A	N/A	N/A
Valleyfield, Dunfermline	UB	X 300920	Y 686848	SO2	N	N/A	N/A	N/A
Mount Frost Drive, Markinch (1,2,3)	UB	X 328627	Y 701992	SO2	N	N/A	N/A	N/A

** Triplicate sites*
K = Kerbside, 0-1m from the kerb of a busy road
R = Roadside, 1-5m from the kerb (up to 15m in some cases)
R(F) = façade of buildings on street
UB = Urban Background, >50m from any busy road

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

Table 2.4a shows 2010 statistics for automatic NO_2 measurements at the three locations in Fife. It shows that Appin Crescent, Dunfermline, Bonnygate, Cupar and Admiralty Road, Rosyth have no exceedences for the annual mean NO_2 objective.

Table 2.4b shows the results of automatic monitoring measured against the 1 hour NO_2 objective. There were no exceedances of the 1 hour NO_2 objective for any of the 3 automatic monitoring sites.

Significantly lower concentrations seen at Bonnygate, Cupar, suggests that the traffic controlling measures introduced in mid-July 2009 may be reducing levels NO_2. These measures included a new Urban Traffic Management and Control System and changes to the pedestrian crossings.

Table 2.4a: Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective (40 µg/m^3)

Location	Within AQMA ?	Data Capture 2010 %	Annual mean concentrations (µg/m^3)			
			2007	2008	2009	2010
Appin Crescent, Dunfermline	N	99.3	31*	30	30	29
Bonnygate, Cupar	Y	97.4	**52**	**46**	(33) 32**	32
Admiralty Road, Rosyth	N	98.1	N/A	26***	29	33

** Appin Crescent, Dunfermline started monitoring August 2007.*

*** Bonnygate, Cupar started monitoring December 2005. Bonnygate Cupar did not monitor between February and early July. Period Mean adjustment of 0.95 applied.*

**** Admiralty Road, Rosyth started monitoring March 2008*

Table 2.4b: Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Location	Within AQMA?	Data Capture 2010 %	Number of Exceedences of hourly mean (200 μg/m^3) *If the period of valid data is less than 90% of a full year, include the 99.8th percentile of hourly means in brackets.*			
			2007	2008	2009	2010
Appin Crescent, Dunfermline	N	99.3	0*	0	0	0
Bonnygate, Cupar	Y	97.4	2	3	0 (170)**	0
Admiralty Road, Rosyth	N	98.1	N/A	0***	2	0

** Appin Crescent started monitoring August 2007.*
*** Bonnygate, Cupar started monitoring December 2005. Bonnygate Cupar did not monitor between February and early July.*
**** Admiralty Road, Rosyth started monitoring March 2008.*

Diffusion Tube Monitoring Data

Table 2.5a gives the annual diffusion tube data for 2010. As previously mentioned in this report, and stated in Table 2.5a, the data has been bias corrected using locally calculated bias adjustment factors. For comparison and completeness Fife Council has also provided concentrations bias corrected using the nationally derived bias adjustment factor (**0.78**). This figure is given in brackets.

All of the 2010 data has been period mean adjusted by the factor of **1.08** to take into consideration the missing data from November and December 2010 (calculation of this Period Mean adjustment can be found in Appendix C). There is no data for this period due to adverse weather conditions restricting the collection and distribution of tubes.

All of the monthly diffusion tube results are found within Appendix D of this report. Table 2.5a compares NO_2 diffusion data from 2007, 2008, 2009 and 2010. Duplicate and triplicate site mean concentrations have been calculated using the methodology stated in Section 3.25 in the Technical Guidance (09)[2].

As shown in Table 2.5a and taking into consideration both local and national bias adjustments, a total of 8 diffusion tubes at 4 locations exceeded the NO_2 annual mean objective of 40μg/m^3. These locations are:

- Appin Crescent, Dunfermline
- Bonnygate, Cupar
- Admiralty Road, Rosyth
- St Clair Street, Kirkcaldy

All exceeding diffusion tube sites, apart from Admiralty Road, are considered to be locations of relevant exposure to the general public.

The Bonnygate Cupar diffusion tube 3(A,B) exceeded the 40 μg/m^3 objective when using the national rather than Local bias adjustment factor. At 40.5 μg/m^3 this exceedance is however borderline and Table 2.5a shows that concentrations in the Bonnygate area have decreased over 2009 and 2010. This is consistent with automatic monitoring concentrations. This could be a result of the traffic

management measures introduced in mid 2009. Additional to these measures a building (30/32 Bonnygate) was demolished during 2010. The resulting gap in the canyon effect (created by the buildings on Bonnygate), and in turn increased air circulation, may have also contributed to the reduction in concentrations.

In 2008 Fife Council declared Bonnygate Cupar as an AQMA for NO_2 and PM_{10}, and has since adopted an Air Quality Action Plan to combat these issues. Details of this Action Plan can be seen in Section 4 of this report. Progress to date with the measures in the plan is reported in Appendix F.

Within Appin Crescent diffusion tubes sites 2, 3, 5 and 6 exceed the 40 $\mu g/m^3$ objective. All 4 sites are located between Park Lane and Couston Street. Diffusion tubes within this area have consistently shown elevated concentrations contrary to those seen at the automatic monitoring site.

The 2011 Detailed Assessment for Appin Crescent, Dunfermline, concluded that Fife Council should consider declaring an AQMA at Appin Crescent, Dunfermline encompassing as a minimum all residential properties which lie between Park Lane and Couston Street. The assessment also concluded that Fife Council should consider declaring an area larger than that stated to account for any uncertainties in monitoring and modelling carried out.

Fife Council has already taken these recommendations on board and are progressing the declaration of an AQMA at Appin Crescent in Dunfermline along with the associated further assessment and action planning procedures. Furthermore, Fife Council has already arranged for automatic measurement of PM_{10} at Appin Crescent which commenced in April of this year.

As can be seen in Table 2.5a, concentrations at St Clair Street, Kirkcaldy, diffusion tubes sites (1 and 2) have consistently measured concentrations around the 40 $\mu g/m^3$ objective, with concentrations exceeding the objective in 2008 and 2010. In 2010 concentrations exceeded the objective when corrected using the National derived Bias Adjustment factor. As a result of this, Fife Council has installed an automatic monitoring station (monitoring NO_x and PM_{10}) at St Clair Street to further investigate concentrations in this area. Monitoring commenced in February 2011.

If measured concentrations of NO_2 or PM_{10} continue to exceed the annual mean objective, after 12 months of data has been collected, then in accordance with the Technical Guidance LAQM. TG (09), Fife Council should proceed with a Detailed Assessment for St Clair Street, Kirkcaldy.

Table 2.5a shows that the diffusion tube at Admiralty Road (AQM5) exceeded the 40 $\mu g/m^3$ objective (41.0 $\mu g/m^3$) when corrected using the locally derived bias adjustment factor. This site is to be discontinued however as being situated at a kerbside location is no longer considered as an appropriate monitoring location in accordance with TG 09. Other triplicate diffusion tube sites in Admiralty Road, which are in locations of relevant exposure, show concentrations below the objective, concurring with those measured at the automatic monitoring site.

However, NO_2 concentrations have increased since 2009 in Admiralty Road along with PM_{10} concentrations. Reasons for this increase are not clear. Nevertheless, Fife Council intends to take a precautionary approach and supplement its existing NO_2 diffusion monitoring regime in the Admiralty Road area.

If measured concentrations of NO_2 exceed the annual mean objective, after 12 months of data from sites of relevant exposure, then in accordance with the Technical Guidance LAQM. TG (09), Fife Council should proceed with a Detailed Assessment for Admiralty Road.

2010 results presented in Table 2.5a below are reported to three significant figures.

Table 2.5a: Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA?	Bias Adjust. Factor	Data Capture 2010 %	Annual mean concentrations (Objective 40 µg/m^3) Adjusted for bias			
					2007	2008	2009	2010
West Area								
DRM5	Rumblingwell, Dunfermline	N	0.79	83	23	26	21	27.2 (26.8)
DRM6	Aytoun Grove, Dunfermline	N	0.79	83	13	15	13	13.8 (13.6)
DRM8	Barrie Street, Dunfermline	N	0.79	83	13	15	12	13.6 (13.5)
DRM9A	Appin Crescent (A, B & C), Dunfermline	N$^+$	0.79	75	35	39	34	37.1 (36.6)
C'BEATH	High Street, Cowdenbeath	N	0.78	83	23	28	25	27.2
K'DINE1	N. Approach Rd. A/B, Kincardine	N	0.78	83	37	40	20	20.5
AQM3	St Leonards School, Dunfermline	N	0.79	83	19	22	20	22.5 (22.2)
AQM5	Admiralty Road, Rosyth	N	0.85	83	36	38	32	**41.0** (37.6)
C'GIE DR	Carnegie Drive (A, B & C), Dunfermline	N	0.79	83	31	38	35	37.8 (37.3)
ADM RO	Admiralty Road (A, B,C), Rosyth	N	0.85	83	33	33	31	36.9 (33.8)
ROMON	Admiralty Road, Rosyth A,B,C	N	0.85	83	N/A	26	26	30.6 (28.1)
APP CR1	Appin Crescent 1 Dunfermline	N$^+$	0.79	83	27	32	28	31.2 (30.8)
APP CR2	Appin Crescent 2	N$^+$	0.79	83	40	49	39	**45.6 (45.0)**
APP CR3	Appin Crescent 3	N$^+$	0.79	83	37	40	37	**44.4 (43.9)**
PITT ST	Pittencrieff St Dunfermline	N	0.79	83	22	25	22	23.8 (23.5)
APP CR4	Appin Crescent 4 (A, B,C), Dunfermline	N$^+$	0.79	75	30	34	30	32.6 (32.2)
APP CR5	Appin Crescent 5 (A, B & C)	N$^+$	0.79	83	N/A	N/A	**42***	**44.0 (43.4)**
APP CR6	Appin Crescent 6 (A, B & C)	N$^+$	0.79	83	N/A	N/A	**56***	**53.8 (53.2)**
	East Area							
N/A	Bonnygate 1, Cupar	Y	0.71	83	30	31	31	28.4 (31.2)
N/A	Bonnygate 2, Cupar (11)	Y	0.71	83	36	45	**42**	35.8 (39.3)
N/A	Bonnygate 3A,B Cupar (13A) (13B)	Y	0.71	83	52	50	**46**	36.9 **(40.5)**
N/A	Bonnygate B4 Cupar	Y	0.71	75	41	38	32	31.4 (34.5)
N/A	City Road 1,2 St Andrews	N	0.78	75	24	30	29	33.1
N/A	Bell Street 1, St Andrews	N	0.78	83	29	32	33	36.8
N/A	Bell Street 2, St Andrews	N	0.78	83	26	32	29	30.7
N/A	Windsor Gds, St Andrews	N	0.78	83	6	7	7	6.5
N/A	Cupar Road, Auchtermuchty	N	0.78	83	27	31	30	29.2
N/A	Millfield, Cupar	N	0.71	83	9	10	11	11.7 (12.9)
N/A	South Rd, Cupar	N	0.71	83	14	16	21	17.5 (19.2)
N/A	Crossgate, Cupar	N	0.71	83	23	26	25	25.5 (28.0)
N/A	Ladywynd B5, Cupar	Y	0.71	75	19	22	21	19.4 (21.3)
N/A	Bonnygate West B6, Cupar	Y	0.71	58	30	26	25	22.5 (24.7)

Site ID	Location	Within AQMA?	Bias Adjust. Factor	Data Capture 2010 %	Annual mean concentrations (Objective 40 µg/m^3) Adjusted for bias			
					2007	2008	2009	2010
N/A	Monitor B (ABC) Cupar	Y	0.71	83	34	39	33**	30.9 (33.9)
N/A	4 East Rd, Cupar	Y	0.71	83	15	17	16	14.4 (15.9)
	Central Area							
N/A	St Clair Street 1, Kirkcaldy	N	0.78	83	34	41	38	**41.3**
N/A	St Clair Street 2, Kirkcaldy	N	0.78	83	34	41	39	**43.7**
N/A	St Clair Street 3, Kirkcaldy	N	0.78	83	31	35	33	36.5
N/A	Wedderburn Road, Kirkcaldy	N	0.78	75	12	13	13	11.5
N/A	Lovat Rd, Glenrothes	N	0.78	83	18	19	18	18.7
N/A	Dunnikier Road, Kirkcaldy	N	0.78	83	29	33	30	32.5
N/A	Victoria Road, Kirkcaldy	N	0.78	83	30	36	34	34.6
N/A	Glenlyon, Leven	N	0.78	83	27	30	27	32.4
N/A	Leslie High Street, Leslie	N	0.78	83	20	24	24	25.1
N/A	ASDA R/B, Kirkcaldy	N	0.78	83	26	33	33	32.4
N/A	Queensway, Glenrothes	N	0.78	83	20	26	24	23.9

** Period Mean Adjustment of 1.10 applied to non bias corrected data.*
*** Period Mean Adjustment of 0.95 applied to non bias corrected data.*
+ AQMA has been proposed in Appin Crescent Detailed Assessment 2010
All NO_2 diffusion tube 2010 data has been Period Mean Adjusted by1.08 to compensate for November and December missing data
2010 data in brackets is adjusted using nationally derived Bias Adjustment Factor (0.78)

INEOS Grangemouth NO_2 Diffusion Tube Results

The air quality survey carried out by INEOS in the vicinity of Grangemouth refinery includes measurement of NO_2. Measurements were made monthly at four sites in Fife using passive diffusion tube techniques. These are presented in Table 2.5b. From 1st January 2010 until 22nd April 2010 monitoring was carried out by NPL, in line with the protocol used in previous studies. From 4th May 2010, the monitoring transferred to INEOS Grangemouth laboratory. The results have been converted from ppb into mass units at 20°C and 1 atmosphere. No data were available to enable bias adjustment of tubes analysed by these laboratories, so the results are presented unadjusted.

The 12-month mean concentrations at these sites remain well within the AQS objective of 40 (µg/m^3).

Table 2.5b: INEOS NO_2 Diffusion Tube Annual Mean Concentrations (µg/m^3)

Site Code	Location	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
16	Ford View, Cairneyhill	11	10	11	13	15	12	13	13	13	15	13
17	Shoreline nr. Charlestown Harbour	10	10	10	17	17	12	19	13	13	17	15
20	Mercer Road, Kincardine	13	11	11	15	19	13	15	19	19	19	19
21	Near Shoreline, Culross	8	8	10	13	13	12	12	13	13	15	11

2.2.2 PM_{10}

PM_{10} concentrations are monitored at automatic sites in Bonnygate, Cupar and Admiralty Road, Rosyth. Details of these sites are given in Table 2.1 and Appendix A. Table 2.6a compares PM_{10} data against the annual mean air quality objectives set for Scotland (18 µg/m^3). Data collected for 2010 shows that both the Bonnygate and Admiralty Road sites exceeded the annual mean objective with concentrations of 19 µg/m^3.

Both sites did not exceed the 24 hour mean objective of 50 µg/m^3. Bonnygate did exceed 50 µg/m^3 three times, however this is within the 7 times per year allowed.

As mentioned previously, Bonnygate Cupar has been designated an AQMA for PM_{10} and an Air Quality Action Plan has been adopted by Fife Council. Concentrations have increased since 2009, however there was no monitoring carried out between February and July which may have distorted the annual mean for 2009. A period mean adjustment (1.04) was applied to compensate for the missing period in 2009. Data capture for PM_{10} in 2010 was 93.1%. Calm weather conditions throughout Scotland in 2010 (especially during the abnormally cold winter months) could have resulted in an increase in PM_{10} throughout Fife.

Admiralty Road has also exceeded the annual mean PM_{10} objective with a measured concentration of 19 µg/m^3. Reasons for this increase are unclear as there were no known activities around the area of Admiralty Road (i.e. a significant increase in traffic, long term road or construction works) which can explain it. This increase however does coincide with an overall increase in NO_2 concentrations in the Admiralty Road area. The abnormal weather conditions again could have contributed to the increased concentrations during 2010.

As this is the first year Admiralty Road has exceeded the annual mean objective for PM_{10} it is suggested that Fife Council continue to monitor PM_{10} for a further 12 months. If concentrations continue to exceed the objective after this 12 month period then it is recommended that Fife Council proceed to a Detail Assessment in accordance with the Technical Guidance LAQM. TG (09)[2].

Additional to the continued PM_{10} monitoring at Admiralty Road, Fife Council is proposing to carry out a six month survey of $PM_{2.5}$. This is being undertaken to alleviate local concerns regarding road traffic emissions and also to understand further the nature of particulate behaviour in this area.

Table 2.6a: Results of PM_{10} Automatic Monitoring: Comparison with Annual Mean Objective (18 µg/m^3)

Location	Within AQMA?	Data Capture 2010 %	Annual mean concentrations (µg/m^3)			
			2007	2008	2009	2010
Bonnygate, Cupar	Y	93.1	23	19	(16) 17*	19
Admiralty Road, Rosyth	N	92.6	N/A	15**	16	19

** Bonnygate Cupar did not monitor between February and early July. Period Mean Adjustment of 1.04 applied.*
*** Admiralty Road started monitoring March 2008.*

Table 2.6b: Results of PM_{10} Automatic Monitoring: Comparison with 24-hour Mean Objective

Location	Within AQMA?	Data Capture 2010 %	Number of Exceedences of daily mean objective (50 µg/m³ not to exceeded more than 7 times per year) *If data capture < 90%, include the 90th percentile of daily means in brackets.*			
			2007	2008	2009	2010
Bonnygate, Cupar	Y		5	1	0 (41)*	3
Admiralty Road, Rosyth	N		N/A	0 (39)**	2	0

** Bonnygate Cupar did not monitor between February and early July.*
*** Admiralty Road started monitoring March 2008.*

2.2.3 Sulphur Dioxide

Automatic Monitoring Data

SO_2 monitoring is undertaken on behalf of Longannet Power Station at Blair Mains, Fife (Grid Reference NS972864) to the north east of the power station. In 2010 Longannet operated with an average load factor of 49.6% (41% in 2009) and burned fuel with average sulphur content of approximately 0.5% (0.5% in 2009). The station emitted 45.2kT of SO_2 during 2010 (~32.2kT in 2009). Emissions were well below the short-term authorisation limit for SO_2 of 2000 mg/m3 at all times.

Results for 2010 for this site are provided along with 2006, 2007, 2008, and 2009 data in Table 2.7.

Table 2.7: Automatic SO_2 Monitoring for Blair Mains (µg/m³)

Period	Data Capture (%)	Max 15 Minute Mean (µg/m³)	Max 1 Hour Mean (µg/m³)	Max 24 Hour Mean (µg/m³)
AQS Objective	-	266 (max. 35 exceedences)	350 (max. 24 exceedences)	125 (max. 3 exceedences)
2006	N/A	166	88	N/A
2007	N/A	138	N/A	N/A
2008	N/A	423	N/A	N/A
2009	99.9	150 (0)	70 (0)	N/A (0)
2010	99.8	238.6 (0)	164.7 (0)	22.9 (0)

According to the Longannet Power Station Report[16], the measured concentrations at Blair Mains indicate that there were no exceedences of the 15-minute mean objective. Measured concentrations also indicated that there were no exceedences of the hourly or the daily SO_2 thresholds. Although maximum 24-hour mean data are not available, the 99.18th percentile daily value was 19.7 µg/m³ (compliance value 125 µg/m³), and the 99.73th percentile was 62.7 µg/m³ (compliance value 350µg/m³). The annual mean for 2010 was 4.2 µg/m³.

The measurements indicate that the area around Longannet Power Station was in compliance with all relevant SO_2 objectives during 2010.

Diffusion Tube Data:

Although SO_2 diffusion tube data are not considered sufficiently accurate for inclusion in the Review and Assessment process, the following are included for completeness and to provide a broad indication of air quality. Diffusion tubes were deployed by Fife Council at Culross, High Valleyfield and Markinch.

The Mount Frost, Markinch sites operated by Fife Council (Table 2.8a) are close to the Tullis Russell paper mill and helped assess emissions from the coal fired plant at the mill.

The air quality survey carried out by INEOS in the vicinity of Grangemouth refinery includes measurement of SO_2. Measurements were made monthly at four sites in Fife using passive diffusion tube techniques. These are presented in Table 2.8b. From 1st January 2010 until 22nd April 2010 monitoring was carried out by NPL, in line with the protocol used in previous studies. From 4th May 2010, the monitoring transferred to INEOS Grangemouth laboratory. The results have been converted from ppb into mass units at 20 °C and 1 atmosphere.

The Air Quality Strategy includes an objective of 20 μg/m^3 for the annual and winter mean SO_2 concentration, for protection of ecosystems, which is applicable only in rural areas. This may be applicable to the shoreline site at Culross. The annual mean at all sites is well within the AQS objective.

Table 2.8a: Fife Council SO_2 Diffusion Tubes (μg/m^3)

Period	Main St, Culross	Valleyfield, Dunfermline	Mount Frost Drive (1, 2 & 3)
2006	4	4	12
2007	3	4	11
2008	3	5	14
2009	3	5	11
2010	3.3	3.6	6.7

Table 2.8b: INEOS SO_2 Diffusion Tube Annual Mean Concentrations (μg/m^3)

Site Code	Location	2003	2004	2005	2006	2007	2008	2009	2010
16	Ford View, Cairneyhill	3	3	3	3	3	3	5	3
17	Shoreline nr. Charlestown Harbour	8	8	5	5	5	8	5	5
20	Mercer Road, Kincardine	5	3	3	3	3	3	3	3
21	Near Shoreline, Culross	5	3	3	3	5	3	3	3

2.2.4 Benzene

Benzene concentrations were measured as a part of the air quality survey carried out by INEOS in the vicinity of Grangemouth refinery. Annual Benzene concentrations from 2001 to 2010 for the four sites located within Fife are shown in Table 2.9. The results have been converted from ppb into mass units at 20 °C and 1 atmosphere. From 1st January 2010 until 22nd April 2010 monitoring was carried

out by NPL, in line with the protocol used in previous studies. From 4th May 2010, the monitoring transferred to INEOS Grangemouth laboratory.

The results show that annual mean benzene concentrations for all sites were well below the AQS objective (for the running annual mean) of 3.25 µg/m^3 for 2010.

Table 2.9: Benzene Diffusion Tube Annual Mean Concentrations (µg m^{-3}) from the NPL network around Grangemouth

Site code	Location	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
16	Ford View, Cairneyhill	0.98	0.65	0.98	0.98	0.65	0.65	0.65	0.98	0.98	0.98
17	Shoreline nr. Charlestown Harbour	1.30	0.65	0.98	0.98	0.98	0.65	0.65	0.98	0.98	1.31
20	Mercer Road, Kincardine	0.98	0.98	0.65	0.65	0.65	0.65	0.98	0.98	0.98	1.31
21	Near Shoreline, Culross	0.98	0.98	0.98	0.98	0.98	0.98	0.65	0.98	0.98	1.31

2.2.5 1,3 Butadiene

The INEOS ambient air quality survey in the vicinity of Grangemouth refinery included measurement of 1,3-butadiene. Results for the four sites within Fife for 2001 to 2010 are shown in Table 2.10. The results have been converted from ppb into mass units at 20 °C and 1 atmosphere.

All four sites located in Fife meet the AQS running annual mean objective of 2.25 µg/m^3.

Table 2.10: 1,3-Butadiene Diffusion Tube Annual Mean Concentrations (µgm^{-3}) from the NPL network

Site code	Location	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
16	Ford View, Cairneyhill	0.14	0.11	0.16	0.09	<0.1	<0.1	<0.1	<0.1	<0.1	0.11
17	Shoreline nr. Charlestown Harbour	0.18	0.14	0.14	0.14	<0.1	<0.1	<0.1	<0.1	<0.1	0.11
20	Mercer Road, Kincardine	0.11	0.11	0.14	0.11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
21	Near Shoreline, Culross	0.18	0.11	0.14	0.18	<0.1	<0.1	<0.1	<0.1	<0.1	0.11

2.2.6 Carbon Monoxide

As in previous years, short periods of CO monitoring have been undertaken by Fife Council Transportation Services at a number of roadside locations. Measurements were undertaken with Marksmann 660 street monitors. The results are summarised in Table 2.11. The results have been converted from ppm into mass units at 20 °C and 1 atmosphere.

Table 2.11 Fife Council CO Monitoring Results

Site Number/ Location	Monitoring Period	Max 8-Hour Concentration (mg/m^3)
Bothwell Gardens, Dunfermline	30/04/10 – 06/05/10	1.25
	24/07/10 – 30/07/10	0.81
	26/10/10 – 01/11/10	0.46
Carnegie Drive/Pilmuir Street, Dunfermline	30/04/10 – 06/05/10	0.61
	10/07/10 – 16/07/10	0.82
	14/10/10 – 20/10/10	1.29
Appin Crescent, Dunfermline	30/04/10 – 06/05/10	2.04
	10/07/10 – 16/07/10	0.29
	14/10/10 – 20/10/10	0.92
Glenlyon Road, Leven	10/02/10 – 22/02/10	1.03
	27/05/10 – 02/06/10	1.97
	20/08/10 – 26/08/10	0.34
Mossmorran	21/07/10 – 27/07/10	0.22
	26/10/10 – 01/11/10	0.75
Bonnygate, Cupar	25/05/10 – 31/05/10	1.80
Admiralty Road, Rosyth	21/09/10 – 27/09/10	0.68
St Clair Street, Kirkcaldy	10/09/10 – 16/09/10	0.25
Dunniker Rd/Victoria Rd, Kirkcaldy	18/06/10 – 24/06/10	0.93

Whilst none of these monitoring periods are sufficiently long to permit a full assessment of CO concentrations over a full annual period, they all indicate that all concentrations are likely to be below the AQS objective of 10 mg/m^3 for the running 8-hour mean concentration.

2.2.7 Additional Monitoring

MOSSMORRAN & BRAEFOOT BAY INDEPENDENT AIR QUALITY MONITORING REVIEW GROUP- 2009 Annual Report

The Mossmorran & Braefoot Bay Independent Air Quality Monitoring Review Group (the Review Group) was formed to provide advice and recommendations to Fife Council regarding the monitoring of air emissions arising from the operations at the Mossmorran plants and the Braefoot Bay terminal facilities (operated by Shell UK Limited and ExxonMobil Chemical Limited).

Pollutants within the annual report[18] produced, included CO, NO_x (oxides of Nitrogen) SO_2, and benzene. The emissions monitored for 2009 and submitted to SEPA are summarised for each regulated source at Mossmorran and Braefoot Bay and are in Appendix E of this report.

The 2009 report[18] concluded that emissions from regulated sources within the plants in 2009 remained well within the limit values set by SEPA for the protection of public health and the environment. These results were consistent with the previous work of the Review Group. In the areas around Mossmorran and Braefoot Bay the 2010 air quality objective for benzene is being satisfied readily.

2.2.8 Summary of Compliance with AQS Objectives

Fife Council has examined the results from monitoring in the area in 2010. New monitoring data highlighted air quality issues for NO_2 at; Bonnygate, Cupar; Appin Crescent, Dunfermline; Admiralty Road, Rosyth and St Clair Street, Kirkcaldy. Air Quality issues were also highlighted at Bonnygate Cupar and Admiralty Road for PM_{10}.

Bonnygate, Cupar has already been declared an AQMA.

In the case of Appin Crescent the diffusion tube measurements for 2010 agree with conclusions made in the 2011 Detailed Assessment, that Fife Council should consider declaring an AQMA at Appin Crescent, Dunfermline, encompassing as a minimum all residential properties which lie between Park Lane and Couston Street on Appin Crescent.

To further investigate elevated concentrations measured at Rosyth, Fife Council should increase their diffusion tube monitoring in Admiralty Road incorporating more locations of relevant exposure. They should also continue with PM_{10} for at least another year to confirm if PM_{10} concentrations breach the objective.

Fife Council have installed an automatic monitoring station at St Clair Street, Kirkcaldy, (February 2010) to further investigate concentrations of NO_2 and through association PM_{10}. These results will be considered in the 2012 USA.

3 New Local Developments

3.1 Road Traffic Sources

Fife Council confirms that there are no new relevant road sources in the local area.

3.2 New Industrial Installations

3.2.1 Poultry Farming

Based on experience from studies carried out by the Environment Agency, the Department for Environment Northern Ireland and a number of local authorities, poultry farming facilities have the potential to cause localised exceedences of the PM_{10} objectives. Fife Council has identified one farm (Mill View Farm formerly Diddlum Farm) which meets the specified criteria stated within Technical Guidance (09).

Mill View Farm, Strathore Road, Thornton (326876, 697373) is owned by Deans Food Limited (PPC/A/1008780) and has approximately 432,000 laying hens housed in 6 naturally ventilated (supplemented by a mechanical system) poultry sheds. Previous Air Quality Review and Assessment reports (USA 2009 and Progress Report 2010) concluded that due to the number of hens and distance to the nearest relevant exposure a Detailed Assessment should be carried out for this site when the farm is fully operational, with a hen population of over 400,000.

Mill View Farm became fully operational during 2010.

However since these conclusions were made the following statement was issued by DEFRA (March 2010) in relation to Poultry Farms.

"Detailed Assessments of Poultry Farms:

A number of local authorities have now completed their Updating and Screening Assessments and have identified poultry farms that meet the criteria (as set out in the Technical Guidance (LAQM.TG(09)) that would require proceeding to a Detailed Assessment. It is recognised that the screening criteria in TG(09) have been based on limited data, and it was stated that further information would be provided as and when new information became available. To assist this process, three local authorities in England have been awarded Air Quality Grant funding in order to carry out studies at the poultry farms they have identified, in order to assess both the local risk of exceedences of the air quality objectives, and to provide additional information to verify, or amend if necessary, the current screening criteria.

Until this assessment work is completed, there is no requirement for local authorities to move forward to a Detailed Assessment at this time. *Where local circumstances (such as a history of nuisance complaints related to the farm in question) suggest that it would be preferable to proceed to a Detailed Assessment as soon as possible, authorities are advised to contact the Review and Assessment Helpdesk in order to ensure that any work carried out is in line with best practice. "*

With the above statement in mind and after further discussions with the Review and Assessment helpdesk, Fife Council will not move forward with their proposed detailed assessment until DEFRA releases there findings.

3.3 New Biomass Boilers

Dunfermline High School Biomass Boiler

A biomass boiler of approximately 450 kW has been proposed as part of the heating system for the new Dunfermline High School, in conjunction with conventional natural gas boilers. An air quality assessment was carried out for this boiler in September 2010[19].

A boiler stack height of 13.88 m was modelled to predict the short-term and annual mean ground level concentrations of NO_2 and PM_{10} particulate matter arising through the constant operation of the proposed boiler unit, using measured emission rates. In this pessimistic scenario (pessimistic since the boiler will likely be run for much less time than the whole year), the chosen stack height has been demonstrated to give adequate dispersion to meet Scotland's Air Quality Objectives for the protection of health from PM_{10} and NO_2.

There were no new Biomass Boilers installed or proposed during 2010 which would cause significant impact on local air quality in Fife

3.4 New Developments with an impact on air quality

There were no new developments within Fife Council with a significant impact on air quality. Provided below are updates on proposed new developments within Fife mention in the 2010 Progress Report. They are as follows:

Erection and operation of a biomass fired power station, Port of Rosyth (10/04253/NEA).

The formal consultation response by Fife Council to Scottish Government's Energy Consents Unit for the proposed biomass energy plant at the Port of Rosyth (application under Section 36 of Electricity Act 1989) included the following recommended schedule of conditions relating to air quality issues.

- **Condition 9**. Development shall not commence until a scheme for monitoring air quality, within an area to be prescribed by the Council and SEPA, is submitted to and approved in writing. The scheme shall include measurement location(s) within the relevant areas from which air quality will be monitored, the equipment and methods to be used and frequency of measurements, not less than 12 months prior to the commissioning of the development and for measurements to be undertaken continuously thereafter until plant decommissioning. Reason. To protect air quality.
- **Condition 10**. Development shall not commence until evidence has been provided to demonstrate that there will be no exceedences of the National Air Quality Strategy objectives. The methodology shall be agreed with the Council and SEPA and shall include air dispersion modelling and ambient monitoring of baseline conditions. Where the assessment predicts an exceedance of any of the LAQM national air quality objectives, the applicant shall provide a scheme for mitigating their impacts for approval by the Council and SEPA and thereafter implemented in accordance with said details. Reason. To protect public health.

Proposed Rosyth International Container Terminal: Babcock Marine Rosyth Limited (10/01376/PAN): (Fife Council Consultation Response on Harbour Revision Order (HRO)).

Fife Council's Environmental Services has requested that further information be sought from Babcock in relation to the air quality impact assessment undertaken for the Rosyth International Container Terminal. Specifically, this includes providing further detail in relation to:

- Assumptions made regarding average traffic speed and concentrations of particulates including $PM_{2.5}$ and PM_{10}.
- The screening threshold process used for road traffic pollutants (including provision of road traffic data).
- Clarification of inconsistencies (including units of measurement) in the nitrogen dioxide (NO_2) and particulate matter (PM_{10}) results provided in the main report compared to those in relevant appendices (DMRB Screening Modal Outputs).
- Clarification of discrepancies between modeled and actual monitored levels of PM_{10} at Admiralty Road, Rosyth.
- The assessment of cumulative impacts from the proposed development with other relevant existing and proposed developments, including the potential for slight to moderate adverse cumulative traffic impacts associated with increased construction vehicle related movements.

Park and Choose Site, Land to North Of Halbeath Roundabout, Dunfermline (11/01056/EIA).

Fife Council Environmental Services have advised that a suitable air quality monitoring scheme should be undertaken for this proposed development.

The following information was also provided by SEPA giving details of changes to regulated industrial processes during 2010.

- Semefab (manufacture of semiconductors), Glenrothes, are expanding their process and installing a new wet scrubber to abate acid gas emissions. SEPA considers this to be a relatively small process with increases in emissions being minimal.
- Blair House Open Cast Coal Site, Oakley, gained its PPC permit in 2010, however work has not yet started.

The following industrial processes (all of which are Part B processes) surrendered their PPC licence or ceased to operate in the past year:

- Brand and Rae, Springfield (manufacture of concrete blocks),
- Finnforest, Leven (treatment of telegraph poles with creosote)
- Havelock Europa, Dalgety Bay (manufacture and painting of shop fittings and furniture), closed with some operations moving to ESA McIntosh, Kirkcaldy.

There were no new developments during 2010 which would cause a significant impact on local air quality in Fife.

3.5 Landfill Sites and Quarries

St Ninians Surface Mine –Southern Extension (10/03505/EIA)

The site operator has applied for a further southern extension to existing St Ninians surface mine to allow for the extraction of coal by surface mining methods with subsequent restoration of Loch Fitty and surrounding land to agriculture, nature conservation and public amenity. The updated Air Quality Assessment concluded that the operation of the proposed scheme and associated road traffic would have a limited impact on local air quality and that there were no predicted exceedences of Air Quality objectives.

Muir Dean Surface Mine- Annfield Extension (10/02006/PAN)

In relation to the proposed Muir Dean Surface Mine – Annfield Extension (10/02006/PAN), Fife Council Environmental Services have advised that the Environmental Statement (ES) include a detailed assessment of potential air quality impacts.

Fife Council confirms that there are no further actions required for landfill sites, quarries or similar operations that have been granted planning permission since the last report.

4 Implementation of Action Plans

Where an authority identifies that a given air quality objective is likely to be exceeded at a relevant location, it is obliged to declare an Air Quality Management Area (AQMA) and undertake a Further Assessment of existing and likely future air quality. The Authority must then develop an Air Quality Action Plan (AQAP), setting out the local actions that will be implemented to improve air quality and work towards meeting the objectives.

Fife Council declared an AQMA for Bonnygate, Cupar in October 2008 which came into force in December 2008. The findings of the Further Assessment[13] indicate that road traffic is the principal source responsible for the local exceedences of NO_2 and makes a significant contribution to local PM_{10} concentrations. Background sources constitute the principal sources of PM_{10} within the Bonnygate AQMA, however, background sources are difficult to address at the local level.

A steering group including key representatives from relevant services of Fife Council was formed to develop the draft AQAP. The steering group considered the findings of the Further Assessment and the wide range of potential options for improving air quality within the Bonnygate AQMA. Subsequently the steering group undertook an assessment of each of these options. The options were assessed against the following criteria:

- How much support was there initially within the steering group for the option?
- Potential air quality impact;
- Potential costs;
- Overall cost-effectiveness;
- Potential co-environmental benefits, risk factors, social impacts and economic impacts;
- Feasibility and Acceptability.

The assessments were then considered in total to place the options in a prioritised order. This then became the draft AQAP.

Fife Council adopted the finalised Air Quality Action Plan in October 2010[14] following approval by Fife Council North East Fife Area Committee.

The AQAP aims to work towards reducing transport emissions of NO_x and PM_{10} in the AQMA by approximately 53% and 33% respectively. The required improvements appear to be quite onerous, however, it should be noted that these represent the ambient concentrations required to meet the objectives, not the reduction in mass emissions, as a result of the canyon effect within the Bonnygate AQMA. It is anticipated that a reduction of this scale will lead to the achievement of the annual mean NO_2 air quality standard (40 $\mu g/m^3$) and Scottish annual mean objective for PM_{10} (18 $\mu g/m^3$) within the Bonnygate AQMA in future years.

Provided in Appendix F of this Report is the Bonnygate Air Quality Action Plan Progress Report – Summary Table. This table summarises Fife Council's progress to date in terms of implementing the finalised Action Plan for Bonnygate Cupar.

5 Local / Regional Air Quality Strategy

5.1 Fife Council Carbon Emissions Reduction Plan

Fife Council is committed to reduce its carbon emissions by 80% by 2050. The Carbon Emissions Reduction Plan (2009) was developed to provide managers within the Council with the tools to build carbon emission reductions into day-to-day service delivery and long term planning. In addition to helping the Council meet its own carbon emission reduction targets, the Plan has been designed to support the achievement of the Scottish Government's national climate change targets. The vision of the plan is to enable Fife Council to thrive in a low carbon economy, facilitating the transition to a low carbon organisation whilst maintaining quality services. Through embedding carbon emissions reduction, environmental awareness and efficiency in the use of our assets and operations, Fife Council will be a Leading Green Council. The plan includes the commitment to consider the carbon emissions and environmental impact of all services and projects.

The plan aims to deliver through:

- Setting carbon emissions reduction targets to meet or exceed government legislation;
- Embedding carbon emissions reduction into the culture and governance of the Council; and,
- Developing management tools to embed carbon emissions reduction and carbon efficiency into the Council systems, processes and operations.

The Plan targets reductions in 'direct emissions' from Council buildings, infrastructure energy, transport fleet fuel and commercial waste. Further integration of Fife Council's Carbon Emissions Reduction Plan with the Bonnygate Air Quality action planning process, particularly the targeted reduction in emissions from the Council transport fleet, will be explored including reference to such publications as Environmental Protection UK Air Quality and Climate Change and Scottish Government Low Carbon Scotland 2011 documents.

6 Air Quality Planning Policies

6.1 Fife Community Plan – A Stronger Future for Fife

Fife Council's Community Plan, "A Stronger Future for Fife"[20] is the overarching strategic plan for Fife. It provides a framework for every other strategy and plan that the Council put in place.

The Community Plan sets goals of achieving an Inclusive and Sustainable Fife whilst delivering Best Value and Excellence. Community planning is a way of working that brings together key organisations within Fife with the communities they serve, ensuring that everyone is working together to deliver a shared vision for improving the quality of life. Fife's community planning partners, Fife Council, NHS Fife, Fife Constabulary, CVS Fife, Scottish Enterprise Fife, Communities Scotland and Fife's further and higher education sector have all signed up to the shared vision set out in this plan.

The Council's vision is of a confident, ambitious and caring Fife that is a great place to live, work and visit. The plan outlines the Council's aim to deliver the shared vision of a Stronger Future for Fife by:

- Building a stronger, more flexible and diverse economy;
- Improving health and wellbeing in Fife;
- Creating a well-educated and skilled Fife;
- Sustaining and improving our environment; and,
- Making Fife's communities safer.

6.2 Fife Council Plan 2007-2011

Fife Council's Plan 2007-2011[21] is intrinsically linked to the Council's Community Plan and outlines the Council's commitment to make a difference to the people of Fife and provide top performing public services. In order to achieve this, the plan outlines the following key priorities for the Council and how these ambitions will be achieved and progress measured:

1. Improve educational achievement and education for all;
2. Make Fife the Leading Green Council;
3. Increased access to housing;
4. Improved local conditions for economic development;
5. Improved sport, leisure and cultural opportunities;
6. Targeted support to vulnerable people;
7. Improved community safety; and,
8. Become a top performing Council.

Many of the objectives introduced by Fife Council through the Council Plan offer the potential to improve local air quality across Fife, most notably the objective of making Fife the Leading Green Council. This priority objective includes initiatives aimed at:

- Promoting sustainable transportation options and encouraging better travel habits;
- Ensuring that environmental awareness is promoted as part of the education curriculum; and,
- Reducing Council energy use and promoting sustainable procurement.

6.3 State of Environment Report

Fife Council's State of the Environment Report[22] provides an overview and basic analysis of environmental baseline information to support the Strategic Environmental Assessment (SEA) of future plans. The report also provides a summary of progress towards achieving environmental targets set by the 'Take A Pride in Fife Environmental Network' (TAPIFEN) known as Theme Measures and Community Plan Milestones.

The Report includes a Chapter on the atmosphere which relates directly to air quality and climate change. A summary of relevant local air quality information is presented in the report. Information contained in this report includes measured concentrations of air quality pollutants, objectives for improving air quality and reducing emissions, and assessing the vulnerability of the local area to climate change.

6.4 The Fife Structure Plan

The Fife Structure Plan (2006-2026)[23] gained final Scottish Government approval on the 24th May 2009 and represents the strategic element of the development plan for Fife. The Plan sets out the development strategy and strategic land use policies and proposals. It establishes the context for local plans that translate these strategies and policies into site-specific guidance. Together, the Structure Plan and Local Plans will form the Fife Development Plan. The principal aims of the plan are to support the growth of Fife's economy and population, whilst addressing the affordability and quality of housing, ensuring sustainable communities and safeguarding and improving Fife's environment.

The Structure Plan outlines that Dunfermline, Kirkcaldy and St Andrews town centres will constitute the key centres of focus for development, but recognises the need to support other towns and villages in order to achieve balanced and sustainable growth throughout Fife. In order to achieve this, the plan outlines that development will be focused primarily in existing urban areas and in locations that are best placed to support sustainable travel. In particular reference to Cupar, the plan outlines the intention to support the revitalisation of the Town Centre through the proposed delivery of a new relief road which will come forward as part of a new strategic land allocation to the north of the town. The relief road is considered as a long-term goal within the scope of the Bonnygate Cupar AQAP[14].

7 Local Transport Plans and Strategies

Numerous existing policies and strategies adopted at a local, regional and national level can exert significant effects, both positive and negative, on air quality in Fife. The most significant plans that may have an effect on air quality in the local area are summarised below.

7.1 The National Transport Strategy

The National Transport Strategy for Scotland[24] was published in December 2006. The Strategy identified the need to provide an efficient, integrated and reliable transport network that successfully promotes economic growth, protection of the environment, health and social inclusion, and introduced three key strategic objectives:

- To reduce journey times between Scotland's towns/ cities and global markets, tackle congestion and provide access to key markets;
- To reduce emissions to tackle climate change;
- To improve the quality, accessibility and affordability of transport, to give people the choice of public transport as an alternative to the car.

These key objectives have been designed to support the role of Government and respond to the strategic objectives, namely a Wealthier, Fairer, Smarter, Healthier, Safer, Stronger and Greener Scotland.

The plan includes a wide range of commitments aimed at tackling each of the key strategic objectives.

In order to improve journey times and connections, tackle congestion and the lack of integration and connections in transport, the strategy outlines the following commitments:

- Investing to tackle congestion from the School Run;
- Promoting SMART2 measures on all journeys, focusing especially on the commute to work through developing travel awareness and marketing campaigns;
- Exploring with key partners towns across Scotland that promote sustainable travel by reducing car use and promoting cycling/ walking;
- Promoting and encouraging new vehicle technologies;
- Supporting sustainable distribution strategies through the Scottish Road Haulage Association;
- Publishing a Bus Action Plan to help achieve a step change in the quality of bus service provision;
- Introducing integrated ticketing pilots to enhance the passenger journey.

The Strategy clearly states that regional transport partnerships, local authorities and transport operators will be key partners in delivering the strategic outcomes.

7.2 Regional Transport Strategy (2008-2023)

Fife Council is a member of the South East of Scotland Transport Partnership (SEStran). The SEStran Regional Transport Strategy[25] was developed to compliment the objectives of the National Transport Plan and includes 17 sub-objectives that stem from the four high level objectives of economy, accessibility, environment and safety and health.

The Strategy Framework comprises three different types of projects and initiatives:

1. **Region-wide initiatives:** Region wide initiatives that affect the area measures affecting the whole SEStran area e.g. travel behaviour/ planning, integrated ticketing, regional freight initiatives, awareness campaigns and frameworks for parking (standards and management).
2. **Initiatives for specific areas and groups:** Initiatives targeting accessibility and providing minimum levels of service to specific localities and groups, and rural areas.

3. **Network-based initiatives** Covering specific infrastructure schemes and public transport services on principal travel corridors. These include a wide range of measures proposed for movements of strategic importance to the SEStran area. The Regional Strategy makes specific reference to the increasing importance of local air quality, its affects on human health and the role that transport plays in air quality issues in urban areas.

7.3 Fife Council Local Transport Strategy (2006-2026)

This Local Transport Strategy 2006[26] (LTS) sets the 5-year (short term) programme, 10-year (medium term) plan and 20-year (longer term) vision and objectives for transport delivery in Fife. In order to achieve success at a local level, the strategy has adopted a de-centralised approach to service delivery, with teams in West, Central and East areas of Fife having developed local area transport plans through consultation with local communities and stakeholders.

The Strategy has been designed to complement Fife Council's Community Plan, Development Plan and other supporting policies, particularly Fife's Environmental Strategy. The strategy provides an overview of the region's transportation services, pertinent transport issues, visions and objectives together with a list of priorities, policies and projects for future transport provision in Fife. The key vision of Fife's LTS is: *"an integrated and sustainable transport system which is accessible to all and contributes towards a strong economy, strong community and healthy environment."*

Improving links with air quality policies and the Fife Council LTS has already been considered during the production of the recently published Bonnygate Cupar AQAP[15].

8 Conclusions and Proposed Actions

This Progress Report has followed the guidance set in Part IV of the Environment Act 1995 Local Air Quality Management Technical Guidance LAQM. TG(09) to ensure continuity in the LAQM process. The following conclusions arise from the findings in this report:

8.1 Conclusions from New Monitoring Data

Fife Council undertakes extensive automatic and diffusion tube air quality monitoring throughout the local area. This monitoring is carried out to the high standard required for the review and assessment process.

Nitrogen Dioxide

Monitoring of NO_2 at the three automatic sites in Fife showed that concentrations at Appin Crescent, Dunfermline, Bonnygate, Cupar and Admiralty Road, Rosyth were below the annual mean objective. For the second consecutive year, the analyser located at the Bonnygate, Cupar has measured automatic monitoring concentrations below the objective.

Bias adjusted diffusion tube data at 4 locations within Fife, exceeded the NO_2 annual mean objective of 40 $\mu g/m^3$. These locations were:

- Appin Crescent, Dunfermline
- Bonnygate, Cupar
- Admiralty Road, Rosyth
- St Clair Street, Kirkcaldy

Diffusion tube data at Bonnygate Cupar did not exceed the 40 $\mu g/m^3$ objective when using the locally derived bias adjustment factor (0.71). However, when using the national derived bias adjustment factor (0.78) concentrations exceeded the objective at 40.5 $\mu g/m^3$.

Diffusion tube concentrations in the Bonnygate area have decreased over 2009 and 2010, which is consistent with measurements from automatic monitoring. This could be a result of the traffic management measures introduced in mid 2009.

In 2008 Fife Council declared Bonnygate Cupar as an AQMA for NO_2 and PM_{10} and have since adopted an Air Quality Action Plan in 2010 to address the air quality issues.

Within Appin Crescent all diffusion tubes sites (2, 3, 5 and 6) exceeding the objective are located on the South side of Appin Crescent between Park Lane and Couston Street. Diffusion tubes within this area have consistently shown elevated concentrations contrary to those seen at the automatic monitoring site.

Data from this Progress Report supports conclusion made in the 2011 Detailed Assessment for Appin Crescent. It concluded that Fife Council should consider declaring an AQMA at Appin Crescent, encompassing as a minimum all residential properties which lie between Park Lane and Couston Street. It also concluded that Fife Council should consider declaring an area larger than that stated to account for any uncertainties in monitoring and modelling carried out.

St Clair Street, Kirkcaldy, diffusion tubes sites (1 and 2) have consistently measured concentrations around the 40 $\mu g/m^3$ objective, with concentrations exceeding the objective in 2008 and 2010. As a result Fife Council has installed an automatic monitoring station (monitoring NO_x and PM_{10}) at St Clair Street to further investigate concentrations in this area. Monitoring commenced in February 2011.

If measured concentrations of NO_2 continue to exceed the annual mean objective, after 12 months of data has been collected, then in accordance with the Technical Guidance LAQM. TG (09), Fife Council should proceed with a Detailed Assessment for St Clair Street, Kirkcaldy.

Diffusion tube data at Admiralty Road (AQM5) exceeded the 40 μg/m^3 objective. This site is situated at a kerbside location that is not considered relevant exposure to the general public. Other triplicate diffusion tube sites in Admiralty Road, which are in locations of relevant exposure, show concentrations below the objective, concurring with those measured at the automatic monitoring site.

However, NO_2 concentrations have increased since 2009 in Admiralty Road along with PM_{10} concentrations.

Fife Council concludes that to further investigate NO_2 concentrations within Admiralty Road, diffusion tube monitoring should be increased, incorporating more locations of relevant exposure to the general public.

If measured concentrations of NO_2 exceed the annual mean objective, after 12 months of data from sites of relevant exposure, then in accordance with the Technical Guidance LAQM. TG (09), Fife Council should proceed with a Detailed Assessment for Admiralty Road.

PM_{10}

PM_{10} concentrations are monitored at automatic sites in Bonnygate, Cupar and Admiralty Road, Rosyth. Data collected for 2010 showed that both the Bonnygate and Admiralty Road sites exceeded the annual mean objective with concentrations of 19 μg/m^3.

Bonnygate Cupar has been declared an AQMA for PM_{10} since 2008 and an Action Plan was adopted by Fife Council in October 2010.

It has been concluded that Fife Council should continue monitoring PM_{10} at Admiralty Road for another year before moving on to a Detailed Assessment. This conclusion was reached due to

- the annual concentration (19 μg/m^3) being a borderline exceedance of the objective.
- 2010 being the first year concentrations exceeded the objective in the area.
- unusual weather conditions for the year may have contributed to the increase in concentrations.

Additional to the continued PM_{10} monitoring at Admiralty Road, Fife Council is proposing to carry out a six month survey of $PM_{2.5}$. This is being undertaken to alleviate local concerns regarding road traffic emissions and also to understand further the nature of particulate behaviour in this area.

Both sites did not exceed the 24 hour mean objective of 50 μg/m^3, with seven exceedences allowed per year.

Sulphur Dioxide

Results for SO_2 monitoring in Fife in 2010 indicate that AQS objectives for SO_2 are unlikely to be exceeded. There are no new industrial processes, road or other developments that require detailed assessment with respect to this pollutant. Hence, new information in 2009 confirms the conclusion of previous reports that a Detailed Assessment is not required for SO_2.

Carbon Monoxide

Short-term monitoring undertaken by Fife Council's Transportation Services department in 2010 indicates that the AQS objective for CO is likely to be met. There are no new industrial processes, roads or other developments that require detailed assessment with respect to this pollutant. Hence, new information in 2010 confirms the conclusion of previous reports that a Detailed Assessment is not required for CO.

1,3 Butadiene and Benzene

There was no new data in 2010 for 1,3 Butadiene and Benzene.

New Monitoring

Fife Council has installed a new automatic monitoring site at St Clair Street, Kirkcaldy, monitoring NO_2 and PM_{10}. Fife Council also installed additional automatic PM_{10} monitoring at the Appin Crescent, Dunfermline site. These sites were installed in February and March 2011 respectively, and data will be report on in the 2012 USA.

8.2 Conclusions relating to New Local Developments

Mill View Farm, Strathore Road, Thornton became fully operational in 2010 with approximately 400,000 hens. Fife Council has not yet proceeded to a Detailed Assessment due to the statement release by DEFRA in March 2010.

8.3 Other Conclusions

Fife Council has adopted an AQAP for Bonnygate Cupar, setting out the local actions that will be implemented to improve air quality and work towards meeting the objectives.

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Appendices

Appendix A	Automatic Monitoring Sites
Appendix B	QA/ QC Data
Appendix C	Diffusion Tube Bias Calculations and Period Mean Adjustments
Appendix D	Diffusion Tube Data
Appendix E	MOSSMORRAN & BRAEFOOT BAY INDEPENDENT AIR QUALITY MONITORING REVIEW GROUP, 2009 Annual Report- Emissions Data
Appendix F	Bonnygate Air Quality Action Plan Progress Report – Summary Table

Appendix A: Automatic Monitoring Sites

Appin Crescent, Dunfermline

Station Name:	Appin Crescent, Dunfermline
Site Owner/operator:	Fife Council
Easting:	309926
Northing:	687722
Distance to kerb and road name/number	3m + (A907)
Zone/agglomeration:	
Site Classification:	Roadside
Manifold type and height:	Single Teflon tube, inlet height 1.7m
Network affiliation:	Scottish Air Quality Database
Quality control procedures:	UKAS calibration by AEA with Air Liquide gas cylinder
Pollutants measured on site:	NO_x, NO NO_2, PM_{10} (since March 2011)
Instrument manufacturer:	Monitor Europe ME 9841 B
Calibration procedure and frequency:	3-weekly manual calibration and autocalibration every 3 days.
Site service arrangements:	6-monthly service by air monitors
Co-located passive sampler	Triplicate NO_2 tubes installed

Bonnygate Cupar, Fife

Station Name:	Bonnygate, Cupar
Site Owner/operator:	Fife Council
Easting:	337406
Northing:	714574
Altitude:	
Zone/agglomeration:	
Site Classification:	Kerbside (<1m from Kerb)
Distance to kerb and road name/number	0.5m to Bonnygate (A91)
Distance to nearest junction and joining road name/number	Opposite the junction with Ladywynd
Start date of monitoring	19 December 2005
Manifold type and height:	Single Teflon tube, Inlet height 1.7m
Network affiliation:	Scottish Air Quality Database
Quality control procedures:	UKAS calibration by AEA with Air Liquide gas cylinder
Pollutants measured on site:	PM_{10} (TEOM) NOx, NO, NO_2
Instrument manufacturer:	FDMS NOx – Teco i-series
Calibration procedure and frequency:	2-weekly manual calibration
Site service arrangements:	6-monthly service by Air Monitors
Co-located passive sampler	Triplicate NO_2 tubes installed

Admiralty Road, Rosyth

Station Name:	Admiralty Road, Rosyth
Site Owner/operator:	Fife Council
Easting:	311755
Northing:	683503
Altitude:	
Zone/agglomeration:	
Site Classification:	Roadside
Distance to kerb and road name/number	6m (A985(T))
Start date of monitoring	March 2008
Manifold type and height:	Single Teflon tube, Inlet height 2m
Network affiliation:	Scottish Air Quality Database
Quality control procedures:	UKAS calibration by AEA with Air Liquide gas cylinder
Pollutants measured on site:	PM_{10} (FDMS) NOx, NO, NO_2
Instrument manufacturer:	FDMS– R and P NOx – Thermo 42i
Calibration procedure and frequency:	3-weekly manual calibration and autocalibration every 3 days.
Site service arrangements:	6-monthly service by air monitors
Co-located passive sampler	Triplicate NO_2 tubes installed

St Clair Street, Kirkcaldy

Station Name:	St Clair Street , Kirkcaldy
Site Owner/operator:	Fife Council
Easting:	329143
Northing:	692986
Altitude:	
Zone/agglomeration:	
Site Classification:	Roadside
Distance to kerb and road name/number	4.8m, St Clair Street/A921
Start date of monitoring	February 2011
Manifold type and height:	Single Teflon tube, Inlet height 2.5m
Network affiliation:	Scottish Air Quality Database
Quality control procedures:	UKAS calibration by AEA with Air Liquide gas cylinder
Pollutants measured on site:	PM_{10} (FDMS) NOx, NO, NO_2
Instrument manufacturer:	FDMS– R and P NOx – Thermo 42i
Calibration procedure and frequency:	3-weekly manual calibration and autocalibration every 3 days.
Site service arrangements:	6-monthly service by air monitors
Co-located passive sampler	Triplicate NO_2 tubes installed

Appendix B – QA/ QC Data

QA/QC of automatic monitoring

The QA/QC procedures follow the requirements of the Technical Guidance (09) and are equivalent to those used at UK level for the National Network (AURN) monitoring sites. This gives a high degree of confidence in the data obtained, both for measured concentrations at the automatic sites and for establishing robust bias correction factors for diffusion tubes.

In order to satisfy the requirement outlined in the Technical Guidance (09), the following QA/QC procedures were implemented:

- 3-weekly calibrations of the NO_x analyser;
- 6-monthly audits and servicing of the monitoring site;
- Data ratification.

Calibrations of the NO_x analyser were carried out using certified compressed gas standards (ISO17025). This ensured that the calibration gas was traceable to national and international standards. In addition to the calibration, sample filters were changed for NO_x and TEOM analysers and any faults were identified thus minimising data loss.

Audits of the monitoring sites consisted of a number of performance checks to identify any faults with the equipment. The calibration cylinder was also checked against another gas standard in order to confirm the gas concentration. Any identified faults were forwarded on to the service unit for repair.

The final stage of the QA/QC process was to ratify the data. During ratification, all calibration, audit and service data are collated and the data are appropriately scaled. Any suspect data identified are deleted therefore ensuring that the data are of a high quality.

Casella Measurement carried out QA/QC procedures at the SO_2 automatic monitoring site at Blair Mains. These procedures were also to a standard equivalent to the AURN.

QA/QC of diffusion tube monitoring

Diffusion tubes used by Fife Council are supplied and analysed by Tayside Scientific Services (formerly Dundee City Council Scientific Services). The laboratory participates in three schemes which ensure that the NO_2 tube results meet acceptable standards.

1. The WASP scheme is run by the Health and Safety Laboratory. Each month one tube is sent for testing. Results are compared with other participating labs and feedback on performance provided.
2. Every three months three tubes and a blank (for analysis) are supplied for exposure at an intercomparison site operated as part of the Support to Local Authorities for Air Quality Management contract funded by the Scottish Government, Defra and the other Devolved Authorities. Again, results are compared with other participating labs and feedback on performance provided.
3. Each month a QC NO_2 solution is also provided via this contract. This solution is run as an internal check for NO_2 tubes in the laboratory. The solution is tested after every 21 NO_2 tube samples.

Tayside Scientific Services also use in-house quality assurance standards. The tube preparation method is 20%TEA in water.

Appendix C – Diffusion Tube Bias Calculations and Period Mean Adjustments

Diffusion Tube Bias Adjustment Factors

Diffusion tubes may systematically under or over-read NO_2 concentrations when compared to the reference chemiluminescence analyser. This is described as bias and can be corrected for to improve the accuracy of the diffusion tube results, using a suitable bias adjustment factor.

Fife Council's diffusion tubes are prepared and analysed by Tayside Scientific Services. The tubes are prepared by applying solution of 20% TEA in water to the metal grid within the tube end cap. The tubes are then assembled. Tubes are prepared monthly prior to dispatch.

Factors from Local Co-location and National Studies

Figure 1. Local Bias Adjustment Factor from Appin Crescent, Dunfermline.

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	08/01/2010	03/02/2010	46.7	46.5	46.7	47	0.1	0	0.3
2	03/02/2010	03/03/2010	59.1	62.6	65.4	62	3.2	5	7.8
3	03/03/2010	31/03/2010	37.4	34.1	36.4	36	1.7	5	4.2
4	31/03/2010	28/04/2010	42.3	43	39.7	42	1.7	4	4.3
5	28/04/2010	02/06/2010	26.6	27.5	28.3	27	0.9	3	2.1
6	02/06/2010	30/06/2010	25.1	26.8	26	26	0.9	3	2.1
7	30/06/2010	04/08/2010							
8	04/08/2010	01/09/2010	31.7	34	33.2	33	1.2	4	2.9
9	01/09/2010	29/09/2010	29.4	31.9	31.2	31	1.3	4	3.2
10	29/09/2010	03/11/2010	39.2	39.4	41.2	40	1.1	3	2.7
11									
12									
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
43	97	Good	Good
45	100	Good	Good
40	99	Good	Good
29	100	Good	Good
23	100	Good	Good
21	99	Good	Good
17	100		Good
21	100	Good	Good
23	100	Good	Good
26	100	Good	Good
Overall survey -->		Good precision	Good Overall DC

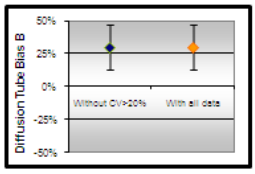
(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Appin Crescent

Precision: 9 out of 9 periods have a CV smaller than 20%

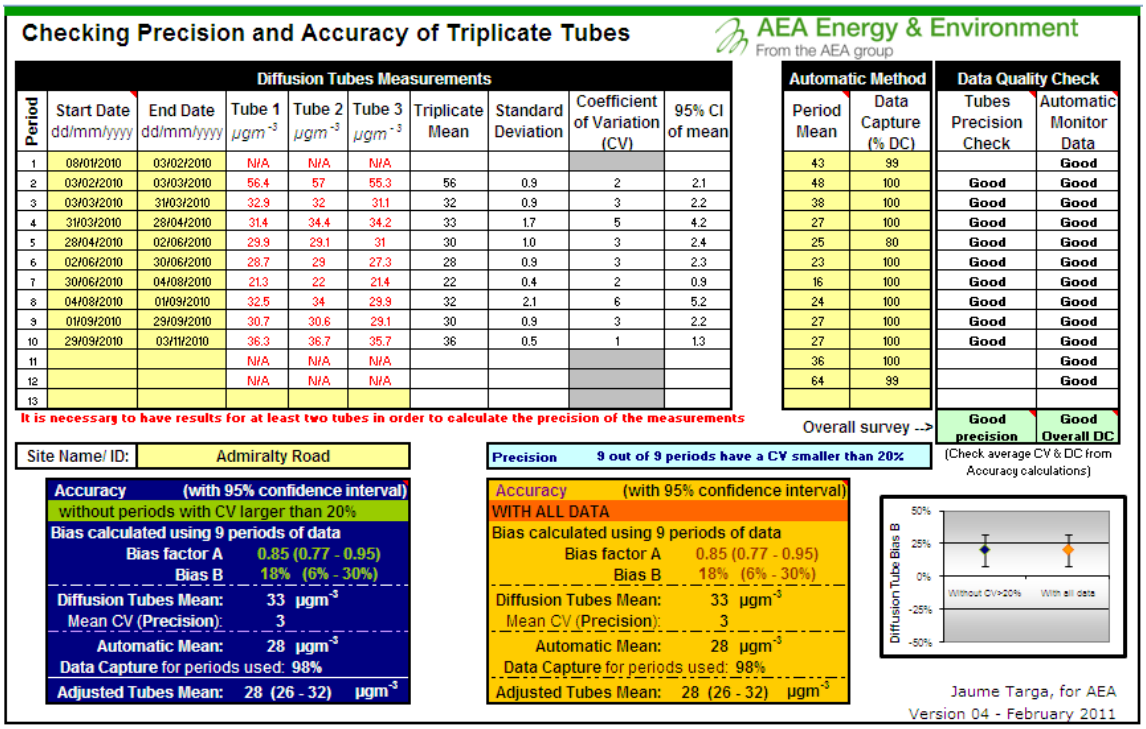
Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 9 periods of data	
Bias factor A	0.79 (0.7 - 0.91)
Bias B	27% (10% - 44%)
Diffusion Tubes Mean:	38 µgm^{-3}
Mean CV (Precision):	3
Automatic Mean:	30 µgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	30 (27 - 35) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 9 periods of data	
Bias factor A	0.79 (0.7 - 0.91)
Bias B	27% (10% - 44%)
Diffusion Tubes Mean:	38 µgm^{-3}
Mean CV (Precision):	3
Automatic Mean:	30 µgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	30 (27 - 35) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

Figure 2. Local Bias Adjustment Factor from Admiralty Road, Rosyth



Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm⁻³	Tube 2 µgm⁻³	Tube 3 µgm⁻³	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	08/01/2010	03/02/2010	N/A	N/A	N/A				
2	03/02/2010	03/03/2010	56.4	57	55.3	56	0.9	2	2.1
3	03/03/2010	31/03/2010	32.9	32	31.1	32	0.9	3	2.2
4	31/03/2010	28/04/2010	31.4	34.4	34.2	33	1.7	5	4.2
5	28/04/2010	02/06/2010	29.9	29.1	31	30	1.0	3	2.4
6	02/06/2010	30/06/2010	28.7	29	27.3	28	0.9	3	2.3
7	30/06/2010	04/08/2010	21.3	22	21.4	22	0.4	2	0.9
8	04/08/2010	01/09/2010	32.5	34	29.9	32	2.1	6	5.2
9	01/09/2010	29/09/2010	30.7	30.6	29.1	30	0.9	3	2.2
10	29/09/2010	03/11/2010	36.3	36.7	35.7	36	0.5	1	1.3
11			N/A	N/A	N/A				
12			N/A	N/A	N/A				
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
43	99		Good
48	100	Good	Good
38	100	Good	Good
27	100	Good	Good
25	80	Good	Good
23	100	Good	Good
16	100	Good	Good
24	100	Good	Good
27	100	Good	Good
27	100	Good	Good
36	100		Good
64	99		Good
		Good precision	Good Overall DC

Overall survey -->

(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Admiralty Road

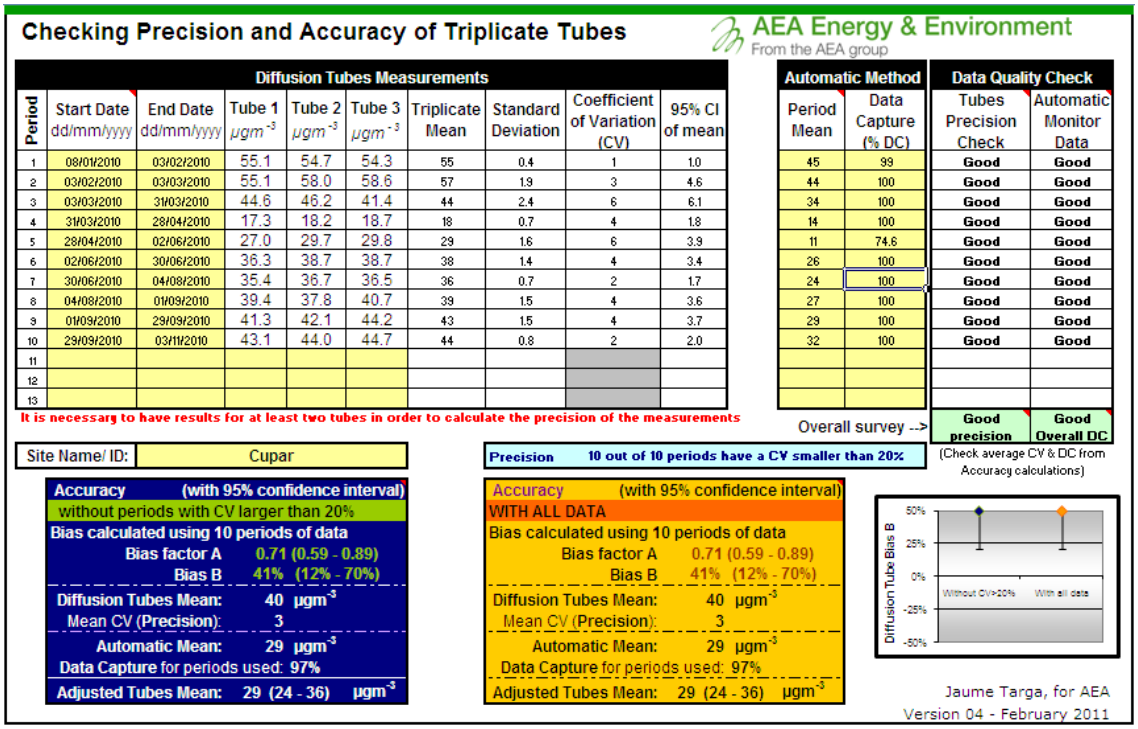
Precision: 9 out of 9 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 9 periods of data
Bias factor A 0.85 (0.77 - 0.95)
Bias B 18% (6% - 30%)
Diffusion Tubes Mean: 33 µgm⁻³
Mean CV (Precision): 3
Automatic Mean: 28 µgm⁻³
Data Capture for periods used: 98%
Adjusted Tubes Mean: 28 (26 - 32) µgm⁻³

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 9 periods of data
Bias factor A 0.85 (0.77 - 0.95)
Bias B 18% (6% - 30%)
Diffusion Tubes Mean: 33 µgm⁻³
Mean CV (Precision): 3
Automatic Mean: 28 µgm⁻³
Data Capture for periods used: 98%
Adjusted Tubes Mean: 28 (26 - 32) µgm⁻³

Jaume Targa, for AEA
Version 04 - February 2011

Figure 3. Local Bias Adjustment from Bonnygate, Cupar



Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm⁻³	Tube 2 µgm⁻³	Tube 3 µgm⁻³	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	08/01/2010	03/02/2010	55.1	54.7	54.3	55	0.4	1	1.0
2	03/02/2010	03/03/2010	55.1	58.0	58.6	57	1.9	3	4.6
3	03/03/2010	31/03/2010	44.6	46.2	41.4	44	2.4	6	6.1
4	31/03/2010	28/04/2010	17.3	18.2	18.7	18	0.7	4	1.8
5	28/04/2010	02/06/2010	27.0	29.7	29.8	29	1.6	6	3.9
6	02/06/2010	30/06/2010	36.3	38.7	38.7	38	1.4	4	3.4
7	30/06/2010	04/08/2010	35.4	36.7	36.5	36	0.7	2	1.7
8	04/08/2010	01/09/2010	39.4	37.8	40.7	39	1.5	4	3.6
9	01/09/2010	29/09/2010	41.3	42.1	44.2	43	1.5	4	3.7
10	29/09/2010	03/11/2010	43.1	44.0	44.7	44	0.8	2	2.0
11									
12									
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
45	99	Good	Good
44	100	Good	Good
34	100	Good	Good
14	100	Good	Good
11	74.6	Good	Good
26	100	Good	Good
24	100	Good	Good
27	100	Good	Good
29	100	Good	Good
32	100	Good	Good
		Good precision	Good Overall DC

Overall survey -->

(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Cupar

Precision: 10 out of 10 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 10 periods of data
Bias factor A 0.71 (0.59 - 0.89)
Bias B 41% (12% - 70%)
Diffusion Tubes Mean: 40 µgm⁻³
Mean CV (Precision): 3
Automatic Mean: 29 µgm⁻³
Data Capture for periods used: 97%
Adjusted Tubes Mean: 29 (24 - 36) µgm⁻³

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 10 periods of data
Bias factor A 0.71 (0.59 - 0.89)
Bias B 41% (12% - 70%)
Diffusion Tubes Mean: 40 µgm⁻³
Mean CV (Precision): 3
Automatic Mean: 29 µgm⁻³
Data Capture for periods used: 97%
Adjusted Tubes Mean: 29 (24 - 36) µgm⁻³

Jaume Targa, for AEA
Version 04 - February 2011

Figure 4. National Bias Adjustment Factor

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 04/11

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated in late June 2011 on the LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1:	Step 2:	Step 3:	Step 4:
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.
If a laboratory is not shown, we have no data for this laboratory	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data[2]	If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[2] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
Tayside SS	20% TEA in Water	2010	K	Dundee CC	12	64	54	18.1%	G	0.85
Tayside SS	20% TEA in Water	2010	R	Dundee CC	10	51	40	29.4%	G	0.77
Tayside SS	20% TEA in Water	2010	K	Dundee CC	11	45	36	26.5%	G	0.79
Tayside SS	20% TEA in Water	2010	K	Marylebone Road Intercomparison	12	127	93	36.8%	G	0.73
Tayside SS	20% TEA in Water	2010		Overall Factor[3] (4 studies)				Use		0.78

Period Mean Adjustment

The Period Mean adjustment was carried out in accordance with Box 3.2: Estimation of annual mean concentrations from short-term monitoring data, from Technical Guidance LAQM.TG(09). The following sites were used to calculate the period mean adjustment factor as they were the best suited Urban background sites available, as stated in Technical Guidance LAQM.TG(09).

See the period mean adjustment figures below.

Figure 5. Period Mean Adjustment Factor

NO_2

	Annual Mean 2010 (Am)	Period Mean 2010 (Pm)	Ratio (Am/Pm)
Glasgow Centre	44	39	1.13
Edinburgh St Leonards	31	27	1.15
Grangemouth AURN	19	20	0.95
		Average (R_a)	**1.08**

Appendix D – Nitrogen Dioxide Diffusion Tube Data 2010

	DRM5 **Rumblingwell Dunfermline**	DRM6 **Aytoun Grove Dunfermline**	DRM8 **Barrie Street Dunfermline**	DRM9A **Appin Crescent A Dunfermline**	DRM9B **Appin Crescent B Dunfermline**	DRM9C **Appin Crescent C Dunfermline**
08/01/10 - 03/02/10	41.6	27.7	25.4	61.2	56.2	57.5
03/02/10 - 03/03/10	49.7	28.9	29.7	65	61.4	62
03/03/10 - 31/03/10	28.4	14.3	13.2	31	N/A	45.5
31/03/10 - 28/04/10	31.3	14.2	14.1	44.5	45.5	43.8
28/04/10 - 02/06/10	28.9	12.6	13	34.6	**12.9**	36.5
02/06/10 - 30/06/10	23.4	11	12.6	31.4	32.7	31.1
30/06/10 - 04/08/10	22.2	10.1	9.5	**45**	30.4	34
04/08/10 - 01/09/10	26.2	12.3	11.9	39	37.3	36.9
01/09/10 - 29/09/10	33.3	12.6	13.9	39.3	39.3	40.2
29/09/10 - 03/11/10	33.3	17.8	16.6	46.9	47.9	50.2
03/11/10 - 07/01/11*	47.5	27.4	29.4	68.7	41.1	64.7

* No tube changeover in December due to adverse weather.
N/A – Tubes missing

	High Street Cowdenbeath	**N. Approach Rd. A Kincardine**	**N. Approach Rd. B Kincardine**	**St Leonards Pri Sch Dunfermline**	**Admiralty Road Rosyth**
08/01/10 - 03/02/10	32.8	35.3	37.3	34.3	56.5
03/02/10 - 03/03/10	51.7	44.7	43.3	41	73.5
03/03/10 - 31/03/10	26	25.3	24	22.4	46.2
31/03/10 - 28/04/10	30.3	25.3	22.9	25.4	44
28/04/10 - 02/06/10	28.8	17.4	18.3	16.9	43.3
02/06/10 - 30/06/10	27.2	17.8	16.5	18.5	41.5
30/06/10 - 04/08/10	27.9	14.8	14.3	15.3	29.1
04/08/10 - 01/09/10	35.3	20	19.2	23	42.4
01/09/10 - 29/09/10	27.6	18.4	19.1	20.5	42
29/09/10 - 03/11/10	35.3	26	27.7	46.7	28.4
03/11/10 - 07/01/11*	44	41	41.4	46.1	72.9

* No tube changeover in December due to adverse weather.

	C'GIE DR.A **Carnegie Drive A** **Dunfermline**	C'GIE DR.B **Carnegie Drive B** **Dunfermline**	C'GIE DR.C **Carnegie Drive C** **Dunfermline**	ADM RO.A **Admiralty Road A** **Rosyth**	ADM RO.B **Admiralty Road B** **Rosyth**	ADM RO.C **Admiralty Road C** **Rosyth**
08/01/10 - 03/02/10	49.3	54.2	53.1	47.1	49.4	53.9
03/02/10 - 03/03/10	60.9	54.2	56.1	68.6	67.8	61.7
03/03/10 - 31/03/10	36.7	34.9	35	40	38.9	36.2
31/03/10 - 28/04/10	55.7	55.9	49.5	41.2	38.6	39.7
28/04/10 - 02/06/10	41.5	41.6	43	33.9	33.5	33.6
02/06/10 - 30/06/10	40.7	40.1	42.6	31.3	30.7	31.2
30/06/10 - 04/08/10	29.7	36.6	30.9	28.3	27.5	27.3
04/08/10 - 01/09/10	40.4	36.5	39.5	35.5	39.2	38.9
01/09/10 - 29/09/10	41.9	40.1	38.4	35.7	13	35
29/09/10 - 03/11/10	49.1	51.3	50.2	43.3	40.1	41.6
03/11/10 - 07/01/11*	51.2	48.9	51.1	61	59.9	59

* No tube changeover in December due to adverse weather.

	ROMON A **Admiralty Road** **Rosyth**	ROMON B **Admiralty Road** **Rosyth**	ROMON C **Admiralty Road** **Rosyth**	APP CR1 **Appin Crescent 1** **Dunfermline**	APP CR2 **Appin Crescent 2** **Dunfermline**	APP CR3 **Appin Crescent 3** **Dunfermline**	PITT ST **Pittencrieff Street** **Dunfermline**
08/01/10 - 03/02/10	N/A	N/A	N/A	41.6	62	61	37.9
03/02/10 - 03/03/10	56.4	57	55.3	53.9	73.7	68.2	42
03/03/10 - 31/03/10	32.9	32	31.1	38.3	47.3	72	25.8
31/03/10 - 28/04/10	31.4	34.4	34.2	36.5	59.4	N/A	33.6
28/04/10 - 02/06/10	29.9	29.1	31	27.5	48.5	45.5	22
02/06/10 - 30/06/10	28.7	29	27.3	39.7	42.6	43.7	20.7
30/06/10 - 04/08/10	21.3	22	21.4	25.3	43.1	36.3	17.3
04/08/10 - 01/09/10	32.5	34	29.9	32.1	49.3	43.5	23.3
01/09/10 - 29/09/10	30.7	30.6	29.1	31	48.7	43.7	25
29/09/10 - 03/11/10	36.3	36.7	35.7	39.2	59.3	54.6	31.2
03/11/10 - 07/01/11*	58.2	56.8	47.9	54.8	N/A	54.7	N/A

* No tube changeover in December due to adverse weather.
N/A – Tubes missing

	APP CR4A **Appin Crescent 4A** **Dunfermline**	APP CR4B **Appin Crescent 4B** **Dunfermline**	APP CR4C **Appin Crescent 4C** **Dunfermline**	APP CR5A **Appin Crescent 5A** **Dunfermline**	APP CR5B **Appin Crescent 5B** **Dunfermline**	APP CR5C **Appin Crescent 5C** **Dunfermline**
08/01/10 - 03/02/10	46.7	46.5	46.7	59	66.7	68.7
03/02/10 - 03/03/10	59.1	62.6	65.4	64.5	71.2	N/A
03/03/10 - 31/03/10	37.4	34.1	36.4	46.1	51.2	51.7
31/03/10 - 28/04/10	42.3	43	39.7	56.4	57	55.6
28/04/10 - 02/06/10	26.6	27.5	28.3	40.1	42.7	41.7
02/06/10 - 30/06/10	25.1	26.8	26	37.8	39.7	40.6
30/06/10 - 04/08/10	**55**	**52.3**	**53**	42	42.1	42.4
04/08/10 - 01/09/10	31.7	34	33.2	45.8	46.8	52.3
01/09/10 - 29/09/10	29.4	31.9	31.2	45.3	45.3	45.2
29/09/10 - 03/11/10	39.2	39.4	41.2	59.4	59.9	61.2
03/11/10 - 07/01/11*	59.7	58.2	60.1	76.4	76	76.7
* No tube changeover in December due to adverse weather. N/A – Tubes missing						

	APP CR6A **Appin Crescent 6A** **Dunfermline**	APP CR6B **Appin Crescent 6B** **Dunfermline**	APP CR6C **Appin Crescent 6C** **Dunfermline**
08/01/10 - 03/02/10	82.4	74.9	75.9
03/02/10 - 03/03/10	76.7	87.3	81.9
03/03/10 - 31/03/10	61	59.3	55.9
31/03/10 - 28/04/10	65.4	74.5	71.8
28/04/10 - 02/06/10	58.2	60.3	60.2
02/06/10 - 30/06/10	56.8	55.3	56.2
30/06/10 - 04/08/10	29.9	48.5	46.7
04/08/10 - 01/09/10	54.3	55.8	59.2
01/09/10 - 29/09/10	54.5	52.7	56.2
29/09/10 - 03/11/10	69.5	69.2	64.9
03/11/10 - 07/01/11*	79.7	59.7	75.1
* No tube changeover in December due to adverse weather.			

East Fife:

	BONNYGATE 1, CUPAR	BONNYGATE 2, CUPAR(11)	BONNYGATE 3A, CUPAR(13A)	BONNYGATE 3B, CUPAR (13B)	BONNYGATE B4 CUPAR	CITY RD 1, ST ANDREWS	CITY RD 2, ST ANDREWS	BELL ST 1, ST ANDREWS	BELL ST 2, ST ANDREWS	WINDSOR GDNS, ST ANDREWS
06/01/10 - 02/02/10	55.7	60.6	67.1	57.7	51.7	41.8	41.7	50.9	38.9	12.9
03/02/10- 03/03/10	44.5	66.9	74.0	65.0	62.4	55.6	58.5	57.0	48.7	13.6
03/03/10 - 01/04/10	42.9	57.2	53.6	57.4	39.7	34.9	35.9	53.3	42.3	9.2
01/04/10 - 28/04/10	16.2	15.6	14.6	17.7	16.8	38.2	38.6	39.6	36.6	6.1
28/04/10 - 02/06/10	26.0	31.3	31.3	33.1	N/A	35.3	33.7	43.2	36.9	5.0
02/06/10 - 30/06/10	32.9	47.2	50.8	47.7	39.4	34.5	34.1	35.8	30.0	4.9
30/06/10 - 04/08/10	33.9	40.5	41.8	41.7	33.0	N/A	N/A	33.6	28.1	4.7
04/08/10 - 01/09/10	37.3	47.9	49.2	51.0	38.7	37.0	35.0	37.7	30.7	5.6
01/09/10 - 29/09/10	39.2	50.8	50.5	54.4	42.4	37.3	38.1	37.2	31.0	5.9
29/09/10 - 03/11/10	41.7	48.8	49.6	53.1	44.3	39.7	38.4	48.7	41.4	8.9

N/A – Tubes missing

	CUPAR RD, A'MUCHTY	MILLFIELD, CUPAR	SOUTH RD, CUPAR	CROSSGATE, CUPAR	LADYWYND B5, CUPAR	BONNYGATE WEST B6 CUPAR	MONITOR BA CUPAR	MONITOR BB CUPAR	MONITOR BC CUPAR	4 EAST ROAD
06/01/10 - 02/02/10	38.6	21.2	38.7	43.4	33.2	39.5	55.1	54.7	54.3	29.3
03/02/10- 03/03/10	48.6	24.3	44.3	53.6	34.3	45.2	55.1	58.0	58.6	29.1
03/03/10 - 01/04/10	38.6	14.9	27.1	34.3	28.4	N/A	44.6	46.2	41.4	23.1
01/04/10 - 28/04/10	32.8	32.7	16.0	19.7	24.0	N/A	17.3	18.2	18.7	15.4
28/04/10 - 02/06/10	29.2	0.1	16.6	24.8	22.8	N/A	27.0	29.7	29.8	13.8
02/06/10 - 30/06/10	30.1	19.0	14.8	36.6	17.7	24.3	36.3	38.7	38.7	12.4
30/06/10 - 04/08/10	28.1	7.7	13.9	24.4	19.1	19.0	35.4	36.7	36.5	13.0
04/08/10 - 01/09/10	38.0	9.4	18.5	28.8	N/A	24.1	39.4	37.8	40.7	15.7
01/09/10 - 29/09/10	30.7	10.6	16.3	32.4	21.8	25.1	41.3	42.1	44.2	15.2
29/09/10 - 03/11/10	31.5	12.7	21.7	34.7	26.1	28.1	43.1	44.0	44.7	21.3

N/A – Tubes missing

Central Fife:

	ST CLAIR ST 1	ST CLAIR ST 2	ST CLAIR ST 3	WEDDERBURN RD	LOVAT RD	DUNNIKIER RD
06/01/10 - 02/02/10	49.9	54.4	48.8	22.6	31.3	44.8
03/02/10 - 03/03/10	67.4	67.3	58.1	24.8	36.3	54.1
03/03/10 - 01/04/10	50.8	69.1	46.4	16.1	30.0	42.7
01/04/10 - 28/04/10	44.8	49.9	41.7	11.9	20.1	37.3
28/04/10 - 02/06/10	47.1	44.9	41.2	0.2	16.3	35.6
02/06/10 - 30/06/10	41.3	50.2	41.1	N/A	18.0	37.3
30/06/10 - 04/08/10	42.5	38.5	34.8	9.2	13.6	29.5
04/08/10 - 01/09/10	41.0	47.2	36.6	10.9	15.8	33.1
01/09/10 - 29/09/10	49.5	48.3	41.6	12.5	18.3	33.0
29/09/10 - 03/11/10	56.3	49.4	42.8	14.5	22.5	38.5
03/11/10 - 05/01/11*	65.7	49.3	42.4	22.2	31.2	41.3

* No tube changeover in December due to adverse weather.
N/A – Tubes missing

	VICTORIA RD	GLENLYON	LESLIE HIGH ST	ASDA R/B	QUEENSWAY
06/01/10 - 02/02/10	47.6	39.1	33.7	37.0	37.2
03/02/10-03/03/10	59.1	48.6	44.2	47.8	35.4
03/03/10 - 01/04/10	39.1	48.3	37.1	40.3	37.1
01/04/10 - 28/04/10	39.3	35.1	28.6	36.6	28.1
28/04/10 - 02/06/10	40.0	31.1	24.8	36.9	21.7
02/06/10 - 30/06/10	41.4	49.7	25.7	39.9	24.2
30/06/10 - 04/08/10	30.4	27.3	18.9	33.4	18.9
04/08/10 - 01/09/10	34.3	32.8	25.0	33.5	22.9
01/09/10 - 29/09/10	37.0	32.7	27.4	37.4	26.5
29/09/10 - 03/11/10	43.0	40.4	33.0	41.8	31.7
03/11/10 - 05/01/11*	47.2	41.6	37.1	40.3	40.6

* No tube changeover in December due to adverse weather.

Appendix E:

MOSSMORRAN & BRAEFOOT BAY INDEPENDENT AIR QUALITY MONITORING REVIEW GROUP, 2009 Annual Report – Emissions data

Table 1: Emissions from Regulated Shell Sources at Mossmorran during 2009

	CO Concentration (mg/m^3)		NO_x Concentration (mg/m^3)		SO_2 Concentration (mg/m^3)	
	Authorised Emissions Limit	2009 average	Authorised Emissions Limit	2009 average	Authorised Emissions Limit	2009 average
Furnace 1	**100**	**<6**	**150**	**80**	**10**	**<10**
Furnace 2	**100**	**<6**	**150**	**90.3**	**10**	**<10**
Furnace 3	**100**	**<6**	**150**	**86.4**	**10**	**<10**

Table.2: Emissions from Regulated ExxonMobil Sources at Mossmorran during 2009 – sources not included in Large Combustion Plant Directive

	CO Concentration (mg/m^3)		NO_x Concentration (mg/m^3)		SO_2 Concentration (mg/m^3)	
	Authorised PPC Emissions Limit	2009 Average	Authorised PPC Emissions	2009 Average	Authorised PPC Emissions Limit	2009 Average
Furnace 1	no limit	nm	350	159.7	no limit	nm
Furnace 2	no limit	nm	350	189.3	no limit	nm
Furnace 3	no limit	nm	350	172.6	no limit	nm
Furnace 4	no limit	nm	350	177.8	no limit	nm
Furnace 5	no limit	nm	350	165.2	no limit	nm
Furnace 6	no limit	nm	350	193.5	no limit	nm
Furnace 7	no limit	nm	350	157.7	no limit	nm
Gas Turbine Stack	no limit	nm	550	316.0	no limit	nm

No limit: no emission limit applied by SEPA
nm: not measured

Table 3: Emissions from Regulated ExxonMobil Sources at Mossmorran during 2009 – sources included in Large Combustion Plant Directive

	CO Concentration (mg/m^3)		NO_x Concentration (mg/m^3)		SO_2 Concentration (mg/m^3)	
	Authorised PPC Emissions Limit	2009 Average	Authorised PPC/LCPD Emissions Limit	2009 Average	Authorised PPC/LCPD Emissions Limit	2009 Average
Boiler A	200	0.3	Limit is fuel weighted (450 on liquid fuel, 350 on gas).	94.8	Limit is fuel weighted (1,700 on liquid fuel, 35 on gas).	28.2
Boiler B	200	1.4	Limit is fuel weighted (450 on liquid fuel, 350 on gas).	104.1	Limit is fuel weighted (1,700 on liquid fuel, 35 on gas).	143.7
Boiler C	200	0.2	Limit is fuel weighted (450 on liquid fuel, 350 on gas).	119.1	Limit is fuel weighted (1,700 on liquid fuel, 35 on gas).	0.3

LCPD = Large Combustion Plant Directive

Table 4: Emissions of Benzene and Total Hydrocarbon from ExxonMobil Regulated Source at Braefoot Bay (Vapour Control Unit) measured in 2009

Date	**Benzene (mg/m^3)** (Authorised Limit = 10 mg/m^3)	**VOCs (mgm^{-3})** (Authorised Limit = 20 mg/m^3)	**Activities during monitoring period**
26 March 2009	<0.17	<0.1	road tanker offloading
03 June 2009	<1.21	2.5	C5+ ship loading
30 June 2009	<1.84	1.0	road tanker offloading
28 September 2009	<1.83	3.3	road tanker offloading
02 November 2009	<1.83	2.6	road tanker offloading
13 November 2009	<0.62	1.4	C5+ ship loading

Appendix F: Bonnygate Air Quality Action Plan Progress Report – Summary Table

Item	Action	Sub-action	Lead Authority	Lead Officer(s)	Timescale	Effect on Air Quality	Progress with measure (against indicators where possible)	Comments	Indicators listed in AQAP	New Proposals/ Objectives for 2011-2012
1	Improving links with Local Transport Strategy/ Area Transport Plan	Reference to Bonnygate AQMA and measures included in Air Quality Action Plan. Integration of plan.	Transportation Services and Environmental Services.	Jane Findlay and Kenny Bisset	Original: 2009-2010; Amended: 2011	Benefit to local air quality - enables the consideration of Air Quality issues in the Bonnygate into Local Transport Planning considerations. **Potential effect of measure to date: Small**	Cupar AQMA and supporting action plan is a section within the developing Revised Fife LTS.	Draft of Revised Fife LTS available in summer 2011	Not possible to assign a quantitative indicator. These are strategic options which will be reported in future versions of LTS and relevant commentary will be provided on specific air quality provisions in such documentation.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
1		Options that will be implemented via the Area Transport Plan (ATP)	Transportation Services and Environmental Services.	Jane Findlay and Kenny Bisset	Originally: 2010; Amended: 2011 - 12	Provision of a cycle-way from the town centre to the trading estate should encourage walking and cycling and contribute to reducing car usage and associated emissions. **Potential effect of measure to date: Small**	Work is being undertaken to widen some of the existing footway and conversion of grass verge to surfaced cycleway (a length of approx 500 metres) to complete a cycleway link from Cupar town centre to Cupar Trading Estate. The Trading Estate is major employment centre for the area within a mile of Cupar town centre and is ideal for commuter walking and cycling.	Scottish Government 2011/12 funding has been provided to progress this measure	Actions to be Detailed in LTS and ATP.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
2	Improving Air Quality links with Local Planning and Development Framework	(a)Integrate AQ Action Plan with Local Plan - liaise with Development Services re: inclusion of specific reference within Local Plan policies to Air Quality Issues and legislative requirements.	Fife Council Development and Environmental Services	Tara Cowley and Kenny Bisset	Original: 2010-2011; Amended: 2010-2012	The Strategic Development Plan for the TAYplan region will be a significant plan guiding development in the area up to 2032. This Plan has considered air quality issues associated with future development in the North East Fife area and makes specific reference to Cupar Relief Road and reducing air pollution. The inclusion of the AQAP within Local Plan documents will encourage the consideration of Local Air Quality Issues	Owing to timescales for Local Plan it is not possible to amend the core policies to include reference to specific Air Quality issues. However preparation of a new Local Development Plan will commence in mid-late 2011. The development of this Plan will offer the opportunity to include new policies in line with legislative requirements and the Climate Change Bill. Fife Council intends to include specific reference to the Bonnygate Air Quality Action Plan within the new Local Development Plan.	The finalised St Andrews & East Fife Local Plan 2009 is being prepared for submission to Scottish Government for Examination. The Plan contains specific reference to AQMA in Cupar and Management Board to administer the Air Quality Action Plan. This includes the direct link in the Local Plan to role of a relief road in alleviating traffic issues in Cupar Town Centre. The finalised St Andrews and East Fife Local Plan 2009: Policy	Inclusion of reference to Bonnygate AQAP within Local Development Plan 2011.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.

Item	Action	Sub-action	Lead Authority	Lead Officer(s)	Timescale	Effect on Air Quality	Progress with measure (against indicators where possible)	Comments	Indicators listed in AQAP	New Proposals/ Objectives for 2011-2012
						within future planning considerations. **Potential effect of measure to date: Low**		E3 on Environmental Impact states that, "New development must make a positive contribution to the quality of its immediate environment both in terms of its environmental impact and the quality of place it will create." The Bonnygate Air Quality Steering Group will also explore the potential for including air quality supplementary guidance in the Local Development Plan. In this regard, extensive research of the approaches taken by other local authorities in producing air quality supplementary guidance has already been undertaken.		

Item	Action	Sub-action	Lead Authority	Lead Officer(s)	Timescale	Effect on Air Quality	Progress with measure (against indicators where possible)	Comments	Indicators listed in AQAP	New Proposals/ Objectives for 2011-2012
2		(b) Ensure development proposals in AQMA are assessed for AQ impacts - Development Services staff to consider Air Quality issues and consult Developer's Guidance note when determining applications within AQMA.	Fife Council Development and Environmental Services	Tara Cowley and Kenny Bisset	2010-2015	The guidance note will increase awareness and consideration of potential air quality impacts of new developments and thus help to prevent deteriorations in local air quality. **Potential effect of measure to date: Low**	Environmental Services and Development Services have produced revised consultation protocol to include consideration of proposed developments within or adjacent to AQMAs. This includes the use of appropriate air quality screening criteria for checking weekly planning application lists. The Developer's Guidance Note has been circulated to senior colleagues in Development Management and awareness of issue raised in L&CP team. Policy planners to ensure consideration of issue in pro-forma response to planning applications/informal proposal discussions - anticipate this will relate to both local and major applications that require a policy response, though cumulative effect to be revised through monitoring of all planning applications in wider catchment area (suggest across the St Andrews & East Fife and Cupar & West HMAs).	Standard consultation protocol revised to include preliminary screening of weekly planning lists for AQ issues. Further awareness amongst Dev. Management staff to be raised through internal seminar (see point 2.e, below)	(1) Publication on Developers Guidance Note on Fifedirect.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
2		(c) Developers guidance note. Development Services staff to liaise with Environmental Services to ensure continued understanding and correct interpretation of Developer's Guidance note – linked to Action (e)	Fife Council Development and Environmental Services	Tara Cowley and Kenny Bisset	2010	The guidance note will increase awareness and consideration of potential air quality impacts of new developments and thus help to prevent deteriorations in local air quality. **Potential effect of measure to date: Low**	Development Services Steering Group representative to ensure colleague's awareness of guidance note and encourage active discussion between both L&CP and Development Management teams and Environmental Services	Main Environmental Services point of contact to be established. The guidance note will be updated, as appropriate, to take due account of latest air quality legislation and guidance.	Publication of relevant promotional materials. Identification of relevant points of contact within associated Council Services.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.

Item	Action	Sub-action	Lead Authority	Lead Officer(s)	Timescale	Effect on Air Quality	Progress with measure (against indicators where possible)	Comments	Indicators listed in AQAP	New Proposals/ Objectives for 2011-2012
2		(d) Promote sustainable developments to minimise AQ impacts - Local Plan policy requires all new developments to incorporate sustainable technology and/or methods.	Fife Council Development and Environmental Services	Tara Cowley and Kenny Bisset	2010-2015	The incorporation of sustainable technologies and methods in new developments should help to minimise the potential air quality impacts of new developments. This measure may require additional consideration of the impacts of biomass boilers in new developments. **Potential effect of measure to date: None**	All planning proposals/registered applications require to be considered against adopted and emerging planning policy. Internal seminar required to ensure Development Services staffs are aware of Air Quality requirements. Specific reference is made to the importance of controlling NO_x emissions in Fife Council Development Services "Creating Sustainable Communities and Buildings. Sustainability Checklist. September 2010" document.	Where a proposal/application does not clearly comply with the requirements set out in the Local Plan additional information will be sought from the applicant. If this information is not supplied a recommendation for refusal of the application will be made by the policy team in L&CP.	Provision of in-house seminar by Environmental Services. Fife Council is also trialling NOx-absorbing tiles on several semi detached properties in Kinglassie. The pilot project represents the first step in Fife Council's investment programme to bring all of its housing stock up to the Scottish Quality Housing Standard. The project aims to help the Council meet one of its strategic priorities of becoming the best green Council in Scotland. http://www.constructionenquirer.com/2011/05/06/pollution-eating-tiles-used-on-scottish-homes/	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
2		(e) Internal seminar on AQ – Environmental Services to co-ordinate internal seminar aimed at Development Services Staff dealing directly with applications or new proposals in Local Plans.	Fife Council Development and Environmental Services	Tara Cowley and Kenny Bisset	Original: 2010; Amended: 2011	This measure will raise awareness of local air quality issues within the Development Services team and facilitate their consideration when applications for new developments are being appraised. **Potential effect of measure to date: None**	Seminar to be organised for summer 2011 to coincide with preparation of the new local Development Plan for Fife. Presentation materials prepared and training events scheduled for 2011.	Owing to ongoing work in progressing each of the 3 Local Plans for Fife through to Examination by the Scottish Government opportunities for a seminar are severely restricted at this time. Seminar to be co-ordinated by Development Services & Environmental Services so that **all** staff active in advising on/negotiating planning proposals are aware of their duties in this regard. Seminars will include specific reference to AQMAs and the planning process.	Completion of internal seminar.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.

Item	Action	Sub-action	Lead Authority	Lead Officer(s)	Timescale	Effect on Air Quality	Progress with measure (against indicators where possible)	Comments	Indicators listed in AQAP	New Proposals/ Objectives for 2011-2012
3	Encourage Integration AQ with other Council strategies	Implementation of AQAP	Fife Council and community planning partners	Kenny Bisset	2010-2015	The integration of Air Quality with other Council strategies will facilitate joined-up thinking and the consideration of possible air quality impacts from the implementation of different strategies. **Potential effect of measure to date: Small**	Fife Council is currently investigating how it can further integrate its air quality action planning process for existing and potential AQMAs with climate change policies in terms of maximising "win win" benefits.	Latest research and guidance into air quality and climate change impact descriptors will be considered. This includes those provided in the recent EPUK "Air Quality and Climate Change: Integrating Policy within Local Authorities" (March 2011) document. This approach is consistent with policies and procedures referred to in the Transport section of the recently published Scottish Government "Low Carbon Scotland. Meeting the Emissions Reduction Targets 2010-22" report	Comparison with AQ Objectives. Please refer to recent monitoring data for Cupar town centre reported in Section(s) of this report. Due to the variability of air quality monitoring data, and the seasonal influences of numerous factors (e.g. prevailing weather), it is recommended that this data is treated with caution until a definitive trend in concentrations can be identified.	Further consideration of latest climate change indicators will be undertaken as these are developed.
4	Target reduced local emissions from freight operations	(a) Undertake a study to assess the feasibility e.g. encouraging freight operators to utilise the South Road(A914) approach to the town in preference to the Bonnygate(A91)	Fife Council Transportation Services	Jane Findlay	Original: 2010-2011; Amended: 2011 onwards.	This measure was assessed in the further assessment and offers the potential of reducing freight associated emissions in the Bonnygate - and associated reductions in air quality pollutant concentrations. The extent of the effect would be dependent upon the proportion of freight that was redirected. **Potential effect of measure to date: None**	**This project is currently on hold.**	Large amount of traffic disruption this year due to road maintenance and emergency bridge repairs. Currently seeking advice from Transport Scotland whether they would consider rerouting of freight on their road network.	Assess the possibility of moving all freight to the South Road. Current Freight Route Map, available on SEStran website, http://www.sestran.gov.uk/files/SEStran%20Freight%20V4-%20by%20town.pdf, hard copies also available on request from SEStran.	Further consideration of latest climate change indicators will be undertaken as these are developed.
4		(b) Continue to meet with stakeholders through the SEStran Freight Quality Partnership to identify key needs, issues and areas for progress.	Fife Council Transportation Services	Jane Findlay	2009-2015	By attending and providing input to SEStran, Fife Council are able to influence actions of the partnership that will potentially help to reduce the impact of road freight on air quality in Cupar and Fife in general. **Potential effect of**	Fife Council provides regular inputs to SEStran including regular attendance and input at meetings.	Freight Route Map has been developed which identifies Cupar as a main destination and distributor of freight within Fife.	Continue to attend the SEStran Freight Quality Partnership and contribute to Air Quality Group within the partnership	Further consideration of latest climate change indicators will be undertaken as these are developed.

Item	Action	Sub-action	Lead Authority	Lead Officer(s)	Timescale	Effect on Air Quality	Progress with measure (against indicators where possible)	Comments	Indicators listed in AQAP	New Proposals/ Objectives for 2011-2012
						measure to date: None				
4		(c) Assess potential for the development of local freight quality partnership aimed at reducing emissions within AQMA and wider area.	Fife Council Transportation Services	Jane Findlay	Original: 2010-2011; Amended: 2011 onwards.	Local freight partnerships offer the potential to reduce local emissions from freight activities and thus contribute to improving air quality. The potential impact of this measure is dependent on its successful adoption and implementation. **Potential effect of measure to date: None**	Work is currently being undertaken to include the potential for a local freight partnership within the Business Travel Plan consultation exercise which is due to take place in the summer of 2011.	Business Travel Plan consultation due to commence summer 2011	Discuss with local operators vehicle emissions and routing policies.	Further consideration of latest climate change indicators will be undertaken as these are developed.
5	Implementation of new Urban Traffic Management and Control System and changes to pedestrian crossings	(a) Installation of new pedestrian crossings in Bonnygate linked to new traffic management system.	Fife Council Transportation Services	Jane Findlay	2009	The UTMC and changes to pedestrian crossings have been successfully implemented. These measures combined with 5(b) have helped to reduce traffic queuing in the Bonnygate street canyon, and thus help to reduce localised concentrations of air quality pollutants. **Potential effect of measure to date: Medium/Large**	Measure complete	The introduction of these measures has coincided with a decline in concentrations of NO_2 and PM_{10} within the Bonnygate. However, due to the potential variation in air pollutant concentrations and effects of factors such as weather conditions, it is recommended that these potential impacts are treated with caution until a distinct trend can be identified.	Completed	Air quality monitoring at the Bonnygate will continue to confirm the effectiveness of these measures.

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5		(b) Implementation of new UTMC in Cupar town centre with synchronised fixed time signals.	Fife Council Transportation Services	Jane Findlay	2009-2011	New UTMC will aim to maximise the efficiency of traffic flow through the town centre and minimise unnecessary traffic queuing within the Bonnygate. This measure aims to reduce emissions from stationary vehicles within the AQMA. **Potential effect of measure to date: Medium/Large**	Measure complete	The introduction of these measures has coincided with a decline in concentrations of NO_2 and PM_{10} within the Bonnygate. However, due to the potential variation in air pollutant concentrations and effects of factors such as weather conditions, it is recommended that these potential impacts are treated with caution until a distinct trend can be identified.	Completed	Air quality monitoring at the Bonnygate will continue to confirm the effectiveness of these measures.
6	Parking Management and Control	(a) Support the objectives of Fife Council's Parking Strategy to discourage long stay commuter parking.	Fife Council – Transportation Service	Jane Findlay	2009-2015	The inclusion of measures to discourage long stay commuter parking could contribute to reducing traffic volume in Cupar and associated emissions by encouraging the use of public transport. **Potential effect of measure to date: Small**	Assessments are currently being undertaken and potential measures/options will be recommended if required for parking, cycling and walking access within Cupar Town Centre.		Discourage long stay commuter parking as part of Fife Council's Parking Strategy.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
6		(b) Length of stay restrictions and parking controls in town centre should be monitored and reviewed annually.	Fife Council – Transportation Service	Jane Findlay	2009-2015	Regular reviews of parking restrictions/ controls can help to encourage the use of public transport when travelling to Cupar. **Potential effect of measure to date: Small**	Assessments are currently being undertaken and potential measures/options will be recommended if required for parking, cycling and walking access within Cupar Town Centre.		On-going monitoring	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.

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6		(c) Continued enforcement of loading restrictions within AQMA.	Fife Council – Transportation Service and Fife Constabulary	Jane Findlay	2009-2015	Inappropriate loading/ unloading activities can result in bottle-necks within the Bonnygate and Crossgate - which can result in additional traffic queuing and increases in emissions. The enforcement of loading restrictions should minimise the potential for such events. **Potential effect of measure to date: Small**	Assessments are currently being undertaken and potential measures/options will be recommended if required for parking, cycling and walking access within Cupar Town Centre.		Police enforce traffic road orders	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
6		(d) Assess the need for on street parking charges to manage the demand for parking.	Fife Council – Transportation Service	Jane Findlay	2010-2011	The management of parking availability should function to encourage the use of public transport instead of private vehicles when travelling to Cupar. **Potential effect of measure to date: Small**	Assessments are currently being undertaken and potential measures/options will be recommended if required for parking, cycling and walking access within Cupar Town Centre.		Carry out assessment	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
7	Review and support proposed infrastructure changes that will contribute to delivering improvements in local air quality	(a) Review and support the proposed delivery of a new relief road which would come forward as part of a new strategic land allocation to the north of Cupar (Structure Plan).	Fife Council – Transportation Service and Development Services	Jane Findlay and Tara Cowley	2012-2015	Adoption of this measure ensures that Fife Council will review any proposed infrastructure changes for their potential impact on local air quality. Where such proposals will contribute to improving local air quality and have neutral/ positive effects on other (socio-economic and environmental) factors, these proposals will be supported. **Potential effect of measure to date: None**	Consultant study underway to investigate alternative models of funding to enable delivery of the Relief Road as an intrinsic part of the Strategic Land Allocation.	Results of study expected in June 2011 - this should recommend whether Fife Council will be able to deliver the Road using alternative funding mechanisms without front-loading developer contributions.	This scheme would be developer funded and therefore could only be implemented through the Development Plan process.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.

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7		(b) Review and support the proposed Cupar, St Catherine Street and The Cross, Traffic and Streetscape Improvements that will contribute to more efficient vehicle movements and enhanced pedestrian accessibility within Cupar Town centre.	Fife Council – Transportation Service and Development Services	Jane Findlay	2009-2012	The successful implementation of this measure should contribute to more efficient vehicle movements and enhanced pedestrian accessibility, and should thus contribute to improving local air quality within Cupar by helping to reduce emissions from road transport. This measure has been designed but implementation is dependent upon capital funding. **Potential effect of measure to date: None**	Cupar Town Centre Improvements – St Catherine Street & The Cross is a designed project which will reduce traffic congestion and improve traffic flow on the A91 Bonnygate, St Catherine Street, and the Crossgate in Cupar by implementing strategic junction improvements and traffic signalisation restructuring, greatly enhancing Cupar town centre for pedestrians.	Fife Council is currently seeking capital funding to implement this scheme.	Feasibility study, design and raise funding to implement proposals.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
8	Target reduction in emissions from buses	(a) Liaise with local bus operators to establish the potential for developing a local bus quality partnership.	Fife Council - Transportation Services	Jane Findlay	2010-2015	The development of a local bus partnership would aim to promote environmental improvement (among other issues), with reductions in emissions (GHG and AQ) from the current fleet being a key objective. If successfully implemented this action should contribute to improving air quality within the Bonnygate and Cupar in general (dependent upon activity data, verified emission factors and maintenance of the fleet vehicles). **Potential effect of measure to date: None**	Fife Council's Transportation Services attend regular liaison meetings with Stagecoach where we are able to raise issues relating to buses and specific services.	Discussions with Stagecoach will continue, however, no further action is being taken at this time with regards to the development of a local bus quality partnership.	Establish a Bus Quality Partnership	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.

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8		(b) Encourage bus operators to improve emission performance of their fleet.	Fife Council - Transportation Services	Jane Findlay	2010-2015	It is anticipated that gradual improvements to the bus fleet that cover the Bonnygate should contribute to potential reductions in emissions of air quality pollutants (dependent upon activity data and maintenance of vehicles). **Potential effect of measure to date: Small**	Stagecoach has invested in new buses serving Cupar.	The improvement of the bus fleet is an on going process. The 68 town service has new midi buses running on the service and have been running since 2009.	New buses and technologies being developed all the time.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
9	Continue to target reduction in emissions from Council Fleet and contract vehicles	(a) Continue procurement of low emission vehicles.	Fife Council – Fleet Services and Procurement and Supplies	Peter Findlay	2009-2015	Improvements in fleet demonstrate that Fife Council is leading by example. Improvements in fleet should make a small contribution to reducing emissions of CO_2 and Air Quality Pollutants within the Bonnygate. This is dependent upon verified emission factors, continued maintenance of the vehicles and no increase in activity within Bonnygate area. **Potential effect of measure to date: Small**	Increase of Euro 5 engined refuse vehicles in East area Total RCV fleet 90% Euro 5 by August 2011. Fife Council specifies within our tenders that the vehicles supplied must at a minimum meet the latest Euro emission standards. From the 1st October 2009 all vehicles were required to meet Euro 5 standards. The next level of emission standards will be in 2013 when Euro 6 legislation is introduced. Fife Council will introduce Euro 6 vehicles into the fleet if available prior to that date.	Replacement of six refuse Vehicles in East Area with new Euro 5 engined vehicles delivery by August 2012	Number of low emissions vehicles in fleet	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
9		(b) Monitor and assess alternative fuels, technologies and fuel additives.	Fife Council – Fleet Services and Procurement and Supplies	Peter Findlay	2009-2015	The replacement of fleet car(s) with electric alternatives should make a small contribution to reducing emissions of air quality pollutants in the Bonnygate. This is dependent upon the electric vehicle replacing an existing vehicle and not an addition to the existing fleet. **Potential effect of measure to date: None**	Procurement of Four full electric cars. Proposal to use one car within Cupar.	Orders to be placed prior to 31 March 2011. Delivery by 31 March 2012	Increase in fleet using alternative fuels	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.

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9		(c) SAFED training.	Fife Council – Fleet Services and Procurement and Supplies	Peter Findlay	2009-2015	It is hoped that driver training will facilitate more fuel efficient driving practices, a reduction in fuel consumption, associated emissions and concentrations of air quality pollutants. **Potential effect of measure to date: Small**	Training of Fife Council LGV drivers to commence 22nd March 2011	Course approval only received 1st March 2011.	Driver certification	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
9		(d) Assess potential for emissions standards for fleet contracts.	Fife Council – Fleet Services and Procurement and Supplies	Peter Findlay	2009-2015	By ensuring that contractor fleets have newer vehicles, Fife Council are encouraging the use of lower emitting vehicles under its contracts. **Potential effect of measure to date: Small**	All vehicle tenders specify latest emission standards or higher.		Number of Vehicles	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
10	AQMA Awareness Signs	To design and erect AQMA signs at various locations within Cupar Town Centre.	Fife Council – Transportation Services	Jane Findlay	2010-2011	**Measure Rejected - No impact on Air Quality.**	Further evaluation of the proposed measure by the Bonnygate Core Air Quality Steering Group has indicated that the measure is unlikely to have a significant benefit in terms of air quality, and does not meet with the intention to promote the area of Cupar. Consequently, Fife Council does not intend to progress this this measure any further and subsequently propose to remove the measure from the Action Plan. **Potential effect of measure to date: None**	Whilst acknowledging that AQMA signage can be used to increase awareness of air quality issues, it is felt that the introduction of such signs in Cupar may lead to AQMA public information overload, in the context of the raft of public awareness/education initiaves already implemented, which in turn may be counterproductive in terms of ensuring positive public engagement with the air quality action planning process. It is also felt that resources can be better deployed on other existing action plan measures	Authorisation, design, procurement and installation.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.

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								which are more likely to produce tangible air quality improvements in the Bonnygate.		
11	Travel plans for large organisations and businesses	(a) Continue the implementation of Fife Council's Travel Plan.	Fife Council – Transportation Services	Jane Findlay	2009-2015	Travel plans include a package of measures to encourage relevant individuals (staff, pupils, students etc) to use alternatives modes of transport rather than single occupancy cars. Measures may include improved cycling facilities, provision of information, car sharing schemes and improved public transport provisions. If implemented effectively, travel plans can help to reduce traffic congestion and also traffic volumes generally. Consequently, travel plans can have a positive impact on the users, but also the environment - such as reducing CO_2 and air	Travel plans for large organisations are currently being rolled out through Council offices across Fife. This process will continue in coming years.		Results of Council travel surveys	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
11		(b) Continue to support the implementation of School Travel Plans.	Fife Council – Transportation Services	Jane Findlay	2009-2015		At present, 73 of the 145 Primary Schools in Fife have produced a School Travel Plan and a further 46 are currently developing plans. 18 of the 19 High Schools in Fife are currently developing their School Travel Plans.		Travel plans implemented and promoted in schools	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.

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11		(c) Work with local businesses/organisations to encourage the development and implementation of travel plans.	Fife Council – Transportation Services	Jane Findlay	2009-2015	quality emissions through reduced fuel consumption. **Potential effect of measure to date: Small**	This measure will be rolled out during 2011 - 2012. Elmwood College have a Travel Plan and Fife Council will engage with the college staff to review the Travel Plan and to assist in its promotion.		Number of large businesses approached regarding the development of travel plans.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
12	Promotion of Cycling and Walking	(a) Development of walking and cycling routes within Cupar.	Fife Council – Transportation Services	Jane Findlay	2009-2015	The provision of a area wide map for cycling and walking should encourage the cycling and walking in preference to the car for some users. This measure therefore offers the potential to help reduce emissions from private vehicles. **Potential effect of measure to date: None**	A town map for walking routes and an area wide map for cycling & walking has been produced (April 2011)		Number/ length of cycling and walking routes developed.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
12		(b) Signage and Interpretation.	Fife Council – Transportation Services	Jane Findlay	2009-2015	The provision of adequate signage can encourage cycling and walking in preference to private cars. Consequently, this measure could contribute to reducing road traffic emissions and help contribute to local improvements in air quality. **Potential effect of measure to date: None**	Routes are currently being audited to determine whether the current level of signage is appropriate or whether additional signing is required.		Installation of Signage	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.

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12		(c) Provision of Cycle Parking throughout the town centre; at workplaces and at Transport interchange points.	Fife Council – Transportation Services	Jane Findlay	2009-2015	The provision of more cycle parking facilities should encourage the use of bicycles in preference to the use of private motor vehicles. **Potential effect of measure to date: Small**	Additional cycle parking has been sourced for 43 schools across Fife.		Installation of cycle parking points.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
12		(d) A programme of led Cycle Rides will be set up in Cupar to encourage people to cycle as part of their daily routine.	Fife Council – Transportation Services	Jane Findlay	Original: 2010-2015; Amended: 2011-2015	This measure aims to encourage people to cycle and may result in some existing car users to cycle instead of drive for some journeys. **Potential effect of measure to date: None**	This measure has still to be implemented, hence the proposed timescale has been amended.		Number of led cycle rides.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
13	Promoting Travel Choices	(a) Production of a Travel Choices map of Cupar	Fife Council – Transportation Services	Jane Findlay	2010-2015	The provision of a travel choices map for Cupar aims to encourage the use of sustainable forms of transport in preference to private motor vehicles. This measure therefore offers the potential of reducing future emissions from road transport. **Potential effect of measure to date: None**	A Travel Choices Map of Cupar has been produced (April 2011). Further details available at www.fifedirect.org.uk/tryit		Creation and publication of map.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.

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13		(b) A Mass Marketing Campaign for Cupar to raise awareness about the project and encourage people to take sustainable modes of travel.	Fife Council – Transportation Services	Jane Findlay	2010-2015	Fife Council has undertaken an extensive marketing exercise to raise awareness about the project since 2010. This has included press releases, a stall at the Farmer's market, and close working with NHS Fife, Community Groups and Schools within Cupar. **Potential effect of measure to date: Small**	Fife Council has undertaken an extensive marketing exercise to raise awareness about the project since 2010. This has included press releases, a stall at the Farmer's market, and close working with NHS Fife, Community Groups and Schools within Cupar.		Undertake marketing	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
13		(c) Production of a community booklet.	Fife Council – Transportation Services	Jane Findlay	2010-2015	**Potential effect of measure to date: None**	A booklet has been produced (April 2011). Further details available at www.fifedirect.org.uk/tryit The Cupar Community Guide and Cupar Walks (Ramblers Scotland map), are all available in Cupar at the Local Office, Library, Tourist Information Office, Elmwood College and Sports Centre.		Production of booklet.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
13		(d) Production of a residential travel pack.	Fife Council – Transportation Services	Jane Findlay	2010-2015	This measure aims to provide guidance on travel options to local residents and thus encourage the use of sustainable forms of transport. **Potential effect of measure to date: Small**	Travel packs have been produced and have been made available to the public.		Production of travel pack.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.

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13		(e) Undertaking individualised Travel Marketing at households throughout Cupar.	Fife Council – Transportation Services	Jane Findlay	2010-2015	This measure aims to provide guidance on travel options to local residents and thus encourage the use of sustainable forms of transport. **Potential effect of measure to date: Small**	A programme of Travel Marketing at individual households in Cupar is currently being undertaken.		Undertaking visits with households.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
13		(f) Undertaking individualised Travel Marketing at businesses throughout Cupar.	Fife Council – Transportation Services	Jane Findlay	2010-2015	This measure aims to provide guidance on travel options to local businesses and thus encourage the use of sustainable forms of transport. **Potential effect of measure to date: None**	Initial contact has been made with businesses during the development of the Community Guide. The wider individualised travel marketing at businesses throughout Cupar is programmed to start during 2011/2012.		Undertaking visits to businesses throughout Cupar to discuss Travel.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
13		(g) New housing developments in Cupar to be designed with the Scottish Government's travel hierarchy in mind and new residential developments set up Car Clubs for use by residents.	Fife Council – Transportation Services	Jane Findlay	2010-2015				Obtain internal and developer agreement to progress the car club's approach by Transport Planning and Development Management	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.

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13		(h) Residential Travel Packs, to be issued to all 'new built' homes identified in the local plan through the planning process.	Fife Council – Transportation Services	Jane Findlay	2010-2015				Travel packs to be distributed to 'new build' homes	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
13		(i) Setting up a car club so that Fife Council pool cars are able to be used by the community for hire at evenings and weekends.	Fife Council – Transportation Services	Jane Findlay	2010-2015	This measure aims to make Council 'pool cars' available for members of the public to hire in the evenings and weekends. This measure provides an alternative to private vehicle ownership and encourages the use of sustainable forms of transport by users at other times. **Potential effect of measure to date: None**	Initial work has been undertaken on this project, with close liaison with the Scottish Government. It is intended that the scheme will be fully implemented during 2011/2012.	Proposed to be up and running next financial year.	Establish Car Club.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.
13		(j) Continue to provide information about public transport services through the Council website.	Fife Council – Transportation Services	Jane Findlay	2009-2015	This measure aims to increase awareness of public transport options in Fife and therefore encourage their use in preference to private motor vehicles. **Potential effect of measure to date: Small**	Fife Council provides information regarding public transport services throughout Fife on the Council's website (Fifedirect.gov.uk). This aims to increase awareness of public transport options and encourage their usage.	On going.	Regular updates of public transport information on Council website	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.

Item	Action	Sub-action	Lead Authority	Lead Officer(s)	Timescale	Effect on Air Quality	Progress with measure (against indicators where possible)	Comments	Indicators listed in AQAP	New Proposals/ Objectives for 2011-2012
14	Provision of information relating to Air Quality and Travel options	(a) Continue to make information relating to local air quality management available through Council website	Fife Council – Transportation, Environmental Services and NHS Fife	Jane Findlay, Kenny Bisset and Dr Jackie Hyland (CPHM)	2009-2015	The provision of LAQM reports provides a valuable source of information to the local public and increases awareness of local air quality issues. **Potential effect of measure to date: Small**	All Fife Council LAQM reports available on Fife Direct website (www.fifedirect.org.uk). This includes the non-technical progress summary leaflet for Bonnygate Air Quality Action Plan (November 2010). Copies of this document were also placed in local Council offices/buildings. There is also a non-technical description of the air quality monitoring regime in the Bonnygate on the Fife Council website along with a direct link to Bonnygate automatic monitor data and statistics on the Scottish Government Air Quality website (www.scottishairquality.co.uk). The Council has also created a customised link from Fifedirect to the Scottish Government's 'Air Pollution Detectives' website which is designed to raise awareness of air quality issues in primary school children.	Non technical summaries are available for all reports on Fife Direct website. The Steering Group is also liasing with relevant local community groups (includes Cupar Futures and Sustainable Cupar Groups) to ensure effective communication arrangements in place. Fife Council will also assess the potential for incorporating the MUSTER model (http://pmj.bmj.com/content/early/2011/03/08/pgmj.2010.102889.abstract) within the Bonnygate AQAP and future air quality work in Fife.	Publication of new LAQM reports and details relating to the Bonnygate AQMA/ AQAP on the Fifedirect.	Fife Council will also assess the potential for incorporating the MUSTER model (http://pmj.bmj.com/content/early/2011/03/08/pgmj.2010.102889.abstract) within the Bonnygate AQAP and future air quality work in Fife.
14		(b) Undertake a publicity campaign to raise awareness of the Bonnygate AQMA.	Fife Council – Transportation, Environmental Services and NHS Fife	Jane Findlay, Kenny Bisset and Dr Jackie Hyland (CPHM)	2010-2011	The publicity campaign will raise awareness of Local Air Quality issues in general and of the Bonnygate AQMA in particular. The measure intends to work with other associated activities in the plan to encourage activities that will contribute to improving local air quality in the Bonnygate AQMA. **Potential effect of measure to date: Small**	The Fife Council "Try It" campaign was officially launched on 8th February 2011. Households across Cupar have now received personalised travel planning advice from trained travel advisors.	The main objective of the "Try It" campaign is a campaign to promote more sustainable transport options to residents of Cupar and therefore seek to improve air quality in the Bonnygate.	Publication of materials, events held, website statistics.	Bonnygate Air Quality Core Steering Group has now been set up which meets on a quarterly basis and it is believed this new group will allow for a more focussed and pragmatic approach to delivering air quality related measures. Part of the remit of this Group will be to ensure ongoing progress with this measure and also considering new proposals/objectives for 2011-2012. These outcomes will be reported in our next annual air quality progress report.